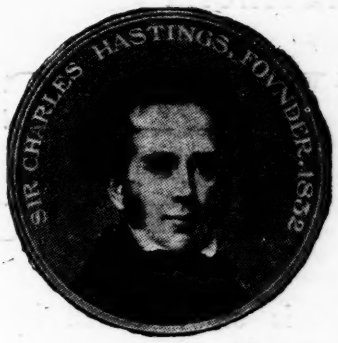
Medical Lib.
SEP 8 1921

The

British Medical Journal



The Journal of the British Medical Association.

INCLUDING AN EPITOME OF CURRENT MEDICAL LITERATURE.

WITH SUPPLEMENT.

No. 3168. SATURDAY, SEPTEMBER 17, 1921. **Price 1/3**

OXFORD MEDICAL PUBLICATIONS

McCarrison's "Studies in Deficiency Disease." Demy 8vo. Cloth. Well Illustrated. Price 30/- net.

Elliot's "The Care of Eye Cases." A Manual for the Nurse, Practitioner and Student. Demy 8vo. Cloth. Illustrated. Price 12/6 net.

Ramsay's "Clinical Ophthalmology for the General Practitioner." Royal 8vo. Cloth. Illustrated in colour and black and white. Price 42s. net.

Ker's "Infectious Diseases." Second Edition. Crown 4to. Cloth. Illustrated in Colour and black and white. Price 42s. net.

Berkeley & Bonney's "A Guide to Gynæcology in General Practice." Crown 4to. Cloth. Well Illustrated. Second Edition. Price 31s. 6d. net.

HENRY FROWDE AND HODDER & STOUGHTON, THE LANCET Building, 1 & 2, Bedford Street, London, W.C. 2.

TREATMENT OF DISEASES OF THE SKIN. 3RD EDITION. 12s. 6d net.
By KNOWSLEY SIBLEY, M.D.Camb.
London: EDWARD ARNOLD, 41 & 43, Maddox St., W.

BOOKS BY
P. LOCKHART MUMMERY, F.R.C.S.
DISEASES
OF THE RECTUM AND ANUS
AND
DISEASES OF THE COLON.
BAILLIÈRE TINDALL & COX,
8, Henrietta Street, Covent Garden, London, W.C. 2.

E. & S. LIVINGSTONE, Publishers,
17, TEVIOT PLACE, EDINBURGH.

JUST PUBLISHED.
Demy 8vo. vii + 278 pp. Price 15/- net, postage 8d.
THERAPEUTIC IMMUNIZATION IN ASYLUM AND GENERAL PRACTICE.
By WM. FORD ROBERTSON, M.D., Pathologist of the Scottish Asylums.
Prospectus sent post free on application.

Crown 8vo. Paper covers, 6d. net; post free 7d.
INTESTINAL DISINFECTION.
WITH A NOTE ON ITS PRACTICAL ATTAINMENT.
By Capt. J. T. AINSLIE WALKER, R.A.M.C. (T.F.), F.I.C., F.C.S.
THE UNIVERSAL MEDICAL PERIODICALS LTD., 36-38, Whitefriars Street, E.C.4.

Crown 8vo. Paper covers, 1s. net; post free, 1s. 1d.
APPROVED TECHNIQUE OF THE
RIDEAL-WALKER TEST.
By SAMUEL RIDEAL, D.Sc., and Capt. J. T. AINSLIE WALKER, R.A.M.C.(T.F.), F.I.C., F.C.S.
H. K. LEWIS & Co. Ltd., 136, Gower Street, W.C.1.

ON DISEASES OF THE
LUNGS AND PLEURÆ.
Including Tuberculosis and Mediastinal Growths.
By SIR R. DOUGLAS POWELL, Bart., K.C.V.O., M.D.(Lond.), F.R.C.P., Physician-in-Ordinary to H.M. the King, &c.; and Sir PERCIVAL H.-S. HARTLEY, C.V.O., M.A., M.D.(Cantab.), F.R.C.P., Phys., St. Bart.'s Hosp.; Senior Phys., Brompton Consumption Hosp.
SIXTH EDITION. With Plates from Original Drawings (6 in colours) and other Illustrations in the Text. Demy 8vo. 42s. net.
".....can confidently be recommended as a safe guide to the practitioner in search of authoritative medical opinion."—*British Medical Journal.*
H. K. LEWIS & Co. Ltd., 136, Gower Street, W.C. 1.

READY NEXT WEEK.
PULMONARY TUBERCULOSIS.
BY
SIR JAMES KINGSTON FOWLER,
K.C.V.O., C.M.G., M.D., F.R.C.P.
With 52 Illustrations. 8vo. 20s. net.
MACMILLAN & Co., Ltd., London, W.C. 2.

ESSAYS ON THE
SURGERY OF THE TEMPORAL BONE.
By Sir CHARLES BALLANCE, K.C.M.G., C.B., M.V.O., M.S., F.R.C.S., Consulting Surgeon to St. Thomas's Hospital, &c.
Illustrated by 125 Plates (40 in colour), and 120 Figures.
In 2 volumes. Medium 4to. Price 7 guineas.
MACMILLAN & Co., LTD., St. Martin's Street, London, W.C.

STERILITY IN WOMEN.
By ARTHUR E. GILES, M.D., B.Sc., Ch.B., F.R.C.S., M.R.C.P., Senior Surgeon to the Chelsea Hospital for Women, Gynæcologist to the Prince of Wales's General Hospital, Tottenham.
Demy 8vo. Cloth. 243 pages. Illustrated. Price 10/- net.
"For the General Practitioner this is an ideal book, full of information."—*Medical World.*
"The best that has been written on the subject."—*British Medical Journal.*
HENRY FROWDE, HODDER & STOUGHTON, 1 & 2, Bedford Street, W.C. 2.

By the same Author.
DISEASES OF WOMEN.
With Sir JOHN BLAND-SUTTON.
7th Edition. WILLIAM HEINEMANN.

GYNÆCOLOGICAL DIAGNOSIS.
AFTER RESULTS OF ABDOMINAL OPERATIONS.
BAILLIÈRE, TINDALL & COX,

By H. WANSEY BAYLY, M.C.
Hon. Sec., Society for the Prevention of Venereal Disease; late Pathologist to the London Lock Hospitals; Medical Officer in charge Venereal Department, St. George's, etc.
VENEREAL DISEASE.
ITS PREVENTION, SYMPTONS & TREATMENT
51 Illustrations. Price 10/6.
J. & A. CHURCHILL, London.
Lancet.—"A crisp and well arranged summary."
Medical Officer.—"The busy practitioner will find it invaluable."
Public Health.—"Original and uncommonly good."

THIRD EDITION. Pp. viii + 92, with 4 Plates. Price 4s. 6d. net. (postage 4d.).
THE INTENSIVE TREATMENT OF SYPHILIS
and Locomotor Ataxia by Aachen Methods.
By REGINALD HAYES, M.R.C.S.
The Lancet says: "No better exposition of the method as practised there can be found than that contained in this little book."
BAILLIÈRE, TINDALL & COX, 8, Henrietta Street, London, W.C. 2.

PIONEERS AND EMPIRE BUILDERS: No. 140
FIFTH PERIOD—circa 6000 to 2000 B.C.

For Safe and
Satisfactory Anæsthesia

TRADE MARK 'WELLCOME' BRAND

Chloroform

Reduced facsimile

is characterised by extreme purity and uniformity.

In its production the greatest care is taken to ensure absolute freedom from products of decomposition liable to irritate the respiratory tract.

It constantly contains that small but definite proportion of ethyl chloride which has been found so beneficial in the induction of chloroform anæsthesia.

Issued in bottles of 2 *oz.*, 1/4 *lb.*, 1/2 *lb.*, 1 *lb.*, 100 *gm.*, 500 *gm. and* 1000 *gm., and in hermetically-sealed tubes of* 30 *c.c.*, 60 *c.c. and* 1/4 *lb.*

BURROUGHS WELLCOME & CO., LONDON
NEW YORK MONTREAL SYDNEY CAPE TOWN MILAN
SHANGHAI BUENOS AIRES BOMBAY

All communications intended for the Head Office should be addressed to SNOW HILL BUILDINGS, LONDON, E.C. 1
London Exhibition Room: 54, Wigmore Street, W.

BI-LINGUAL DICTIONARY OF THE SUMERIAN AND BABYLONIAN LANGUAGES COMPILED BY PIONEER LEXICOGRAPHERS IN ANCIENT MESOPOTAMIA.—The language of the Sumerian gradually died out as a living tongue and its place was taken by the Semitic tongue of the Babylonian conquerors, but the culture of the land was embodied in the ancient texts, and these the now dominant race, read and studied. In this way they kept alive and spread the old learning which they used and added to. In taking over and assimilating the civilisation of the Sumerians, the Semites needed that their scribes should compile explanatory lists of ideograms and words. They adapted the cuneiform writing to their language. Many Assyrian documents are written in the two tongues, "Syllabaries," or dictionaries of which the one here reproduced is an example, enabled the ancient Mesopotamians (and ourselves) to read the early language. The present example has two divisions of four columns each. The second column contains the sign to be explained; in the first the Sumerian meaning is given, the corresponding Babylonian meaning being found in the fourth; the third contains the name of the sign. If the meaning of the Babylonian word is known, that of the Sumerian becomes clear. Cuneiform came to be a system of phonetic writing even in Sumerian times, for each sign was made to represent not an *idea* as with the old ideograms or pictures, but a *sound*—a phonogram. In this way, man's power of expressing his ideas in writing increased infinitely, for he could now write anything that he could speak. The system of writing invented by the Sumerian Mesopotamians was adopted throughout Western Asia; it was the medium of administrative correspondence between towns and provinces on the Mediterranean, and in the fifteenth century B.C. the Egyptian kings wrote letters in cuneiform to the rulers of Western Asia and Syria. It was used continuously from about 4500 B.C. to the first century B.C.! Date: Sumerian Characters, circa 4000 or 3000 B.C.: Babylonian Characters 700 B.C. (the present tablet made 700 B.C.).

COPYRIGHT

EIGHTY-NINTH ANNUAL MEETING

OF THE

British Medical Association.

Held at Newcastle-on-Tyne, July, 1921.

DISCUSSION ON RENAL EFFICIENCY TESTS.*

OPENING PAPERS.

I.—HUGH MACLEAN, M.D., D.Sc.,

Professor of Medicine, University of London, St. Thomas's Hospital.

WITHIN recent years much attention has been paid to the question of renal efficiency tests, and much progress has been made in this field, particularly from the point of view of clinical medicine.

It is somewhat difficult in a conjoint meeting such as we have here to know how to discuss the problem. The particular points which immediately interest the practising physician are to some extent different from those to which the physiologist usually devotes his attention. On the other hand, it is the physiologist who very often paves the way for the physician, and a joint meeting at which the physiologist, the pharmacologist and the clinician meet on common ground cannot fail to be of great interest. In the short time at my disposal I propose to treat the subject more from the clinical than the physiological side, and to give my experience of certain tests of renal function which I have been using for several years.

For the physician the most instructive case of renal deficiency is that seen in severe acute nephritis. Here the renal cells are, temporarily at any rate, knocked out of action, and as a result the normal functions of the kidney are for the time in abeyance.

Speaking generally, the healthy kidney performs three special functions, which may be summarized as follows:

1. Excretion of waste products of nitrogenous metabolism (urea, uric acid, creatinin, purin bodies, etc.).
2. Removal of acid products from the body by which it helps to preserve the normal reaction of the body fluids.
3. Maintenance of the necessary concentration of salts in fluids and tissues.

In severe cases of acute nephritis nitrogenous waste products fail to be eliminated, and so there is an excessive concentration of these bodies in the blood. Little or no sodium chloride is present in the urine, and the water which should be eliminated is retained in the body, giving rise to oedema and ascites. Acid products are not excreted in the ordinary way, so there is some tendency to interfere with the normal mechanism for the regulation of the blood reaction. This condition persists generally for some time, but, in favourable cases, the renal cells sooner or later recover their function to some extent, and marked general improvement, accompanied by diuresis, sets in.

In such acute cases one of the earliest signs of improvement is the return of salt to the urine. The diuresis which usually follows is explained by the large accumulation of urea and water in the system. Indeed, the conditions are generally ideal for marked diuresis, since the excess of urea in the blood acts as a powerful diuretic whenever the renal tissues are sufficiently recovered to react to its stimulus.

In well marked acute nephritis no tests for renal efficiency are necessary, for the symptoms sufficiently indicate the condition. Later, however, it may be necessary to ascertain what progress is being made, and here tests of function are, in my experience, quite as important as, if not more important than, clinical symptoms. Of all renal tests perhaps the most important in such cases is the estimation of the retained nitrogenous products in the blood. The term "non-protein nitrogen" is generally used to express the total nitrogen derived from these bodies, and this non-protein nitrogen may be estimated. This, however, is a somewhat lengthy and difficult process, necessitating care and some technical skill if the results are to be depended on. Quite as much information is to be derived from the much simpler process of estimating the urea present, and the rapidity and ease with which this estimation can be carried out renders it of very great value in renal work. Personally, in routine work, when a blood examination appears necessary I always estimate the blood urea, and have never obtained any additional information from an estimation of the non-protein nitrogen as well.

Importance of Blood Urea and Non-protein Nitrogen Estimations.

Under ordinary conditions the blood always contains a certain amount of urea, but the exact amount which may be considered to represent the normal value is still not quite agreed upon. As the result of a very large number of experiments I have come to the conclusion that the blood of normal individuals may contain from about 15 to 40 mg. urea per 100 c.cm. blood. In young people the normal content lies towards the lower value, and perhaps the maximum should be placed somewhere below 30 mg.; but in elderly people with apparently healthy kidneys it is not uncommon to find a blood urea content of 40 mg. or even a little more. These figures refer to individuals on average ordinary diets. Anything over 45 mg. is suspicious, and when it rises to 50 mg. or over we may, in ordinary circumstances, be fairly certain that the kidneys are inefficient. Certain conditions, such as severe vomiting and diarrhoea, may so deplete the body of fluid that even healthy kidneys fail to maintain the blood urea within its normal limits, but such cases are comparatively rare. While the test is of very great value in many cases, it unfortunately gives no indication of any kidney defect in subacute and chronic cases of Bright's disease until the greater part of the renal tissue is out of action. Animal experiments have shown that three-quarters or so of the total kidney substance may be removed before any accumulation of urea or non-protein nitrogen is found in the blood. Chronic cases with high urea content give, as a rule, little trouble from the point of view of "present condition" and prognosis, for various other symptoms indicate the state of the kidneys with sufficient clearness. It is true that there are exceptions, but, on the whole, one can very often tell beforehand on clinical grounds alone that certain patients have a raised blood urea content.

It is important to note that the excess of urea or other nitrogenous constituents in the blood is not the cause of the symptoms from which the nephritic patient suffers, and it appears certain that urea has nothing to do with the production of uraemia. It is generally not very difficult to reduce the blood urea, even in advanced cases of chronic interstitial nephritis, by giving a diet largely composed of carbohydrates, but this does not relieve the patient. In one such case under my charge the blood urea was reduced from 120 mg. to an average of 30 to 40 mg. per 100 c.cm. blood, but though the blood urea was maintained at this lower level for a considerable period, the patient died of uraemia; his blood urea on the day before death was 30 mg.

The point to note is that a lowering of the blood urea is not necessarily any indication of improvement unless the patient continues on the same kind of diet as he had when the blood urea was found to be high. This unfortunately is frequently forgotten.

In considering the mechanism of urea excretion it is useful to remember that a patient suffering from even an advanced grade of chronic interstitial nephritis excretes practically the same amount of urea daily as does a healthy individual on a similar diet. This seems absurd, but it is of course obvious that if this were not the case the patient would soon become saturated with urea. There is, however, a marked difference between the mode of excretion in the normal and nephritic subject. The normal individual requires what we may term a "head" of 20 mg. or so of urea per 100 c.cm. blood in order to get rid of the 25 or 30 grams excreted daily in the urine. The nephritic, though he excretes as much urea in the urine as the healthy individual, can do this only when the head of urea in the blood is much higher, and this head may amount to 200 mg. per 100 c.cm. blood or even more. The blood urea content is therefore merely an index of the efficiency of the kidney, and when nitrogenous food is

* This discussion took place at a combined meeting of the Sections of Medicine, Pathology and Bacteriology, and Physiology, Pharmacology, Therapeutics and Dietetics, with the Right Hon. Lord Dawson of Penn, Vice-President of the Section of Medicine, in the chair.

largely withdrawn from the diet the necessary amount of urea can be eliminated in the urine with a smaller head of urea in the blood. Even on the same diet one finds variations in blood urea in chronic cases, so that a favourable prognosis should not be expressed as the result of a comparatively low finding unless estimations are made over prolonged periods.

In acute cases estimation of blood urea at periods of a week or ten days is one of the best methods of judging the progress of the disease and in a general way the same applies to subacute conditions. On the whole, the estimation of blood urea is of very great help in acute and subacute cases of nephritis and in advanced cases of interstitial nephritis, but in the latter especially, the results must be used with great care and discrimination. A mere increase in urea or non-protein nitrogen of the blood may mean little or much according to circumstances. The frequency of what must be accepted as acute or subacute exacerbations in chronic cases must be considered. Such exacerbations appear to be of frequent occurrence in patients suffering from renal disease associated with cardio-vascular trouble. In one case of this kind the patient had frequent attacks of mild dyspnoea and general malaise during which his blood urea reached 150 to 180 mg. per 100 c.cm. His urine always contained protein and epithelial casts. I first examined him three years ago when his blood urea was 180 mg. On the whole, the prognosis seemed to be bad. When I last examined him, a week ago, his blood urea was 45 mg. and he felt much better. At various intervals during the intervening period blood urea was sometimes high and sometimes as low as 50 mg. As might be expected, in a chronic case of this kind, other renal tests give no indication of any marked improvement in the function of the kidneys.

In one other type of case, to which I shall refer later, estimation of the blood urea is of very great importance. I mean the type of renal involvement associated with certain genito-urinary diseases such as enlarged prostate, in which surgical interference may be necessary. On the whole, the estimation of urea or non-protein nitrogen in the blood is one of the best tests we have for advanced renal deficiency, but the results must be interpreted with care and the clinical symptoms must of course never be forgotten.

The Diastatic Test.

Normally the blood contains a fairly definite amount of the enzyme diastase which changes starch into sugar. The healthy kidney excretes some of this in the urine, and the amount excreted daily is extraordinarily constant in different individuals. When the kidney is defective the daily excretion of diastase is much diminished. It is easy to estimate the amount of this ferment in the urine, and the so-called diastatic test is now extensively used in kidney disease. Generally speaking, this test is of value in conjunction with other tests, but should never be relied on alone. In the great majority of cases of defective kidney the amount of diastase in the urine is certainly low, but I have seen many patients in whom the kidneys were markedly involved, and yet the diastatic value was normal or above normal. In two patients under my care it was normal on each occasion on which the test was done, and yet both patients died in uraemia within a fortnight of entering hospital. These anomalous results are difficult to explain, and do not appear to depend on changes in the amount of diastase in the blood; at least, this was not so in the few cases I have investigated.

Various Dye Tests.

Of the many dye tests used in this connexion, the most popular at present is phenolsulphonephthalein. Undoubtedly this test often seems to give a fairly good indication of the state of the kidneys, but in my experience the results have not been very satisfactory. When the kidneys are capable of excreting from 40 to 50 per cent. of the dye in one hour there is probably not much disturbance of function. In conjunction with other tests it is undoubtedly of much value, but it is rather technical and, though apparently simple, is really somewhat difficult to carry out with success. The estimation of the amount of dye secreted requires a colorimeter, and though certain investigators consider that the results are accurate when they estimate the excreted dye directly by comparison with a standard in a test tube, it is certain that these results are usually very wide indeed of the mark. When carrying out the test in this way errors amounting to 20 and 30 per cent. are possible. Again, the rate of absorption when the dye is injected subcutaneously is somewhat doubtful, while a venous injection requires some practice and is not always easy. In spite of its drawbacks, however, it is undoubtedly useful when used in conjunction with other tests. Another dye, indigo-carmine, is sometimes of value, but, on the whole, is not very satisfactory.

The "Urea Concentration Test."

This test was introduced a few years ago by MacLean and de Wesselow, and has given very good results. It is carried out as follows: The patient is asked to empty the bladder, and immediately afterwards he receives by mouth 15 grams of urea dissolved in about 100 c.cm. of water. The bladder is emptied one hour and two hours after the urea has been given and the two specimens of urine examined for urea content. If either specimen gives a percentage of urea above 2, the kidneys are held to be fairly efficient; the higher the concentration the more effective is the renal function. The reason why two specimens are taken is that in certain patients the urea given by mouth may produce a diuresis, which tends to dilute the urine passed, especially during the first hour. In this case the second hour's specimen often gives satisfactory results. Indeed, in routine work it is often best to discard the first specimen altogether and rely on the result obtained from the second specimen. Not more than 100 to 120 c.cm. urine should be passed in the second hour. Occasionally, if there is much available fluid in the patient's system, it may be desirable to take a specimen after three hours or even to repeat the test, but this is seldom necessary. In patients with marked diuresis this must be allowed for in estimating the renal function.

The test possesses the advantage that it can be carried out by anybody; it requires no manipulative skill whatever, since all that is necessary is to estimate the urea in the urine by any of the modifications of the ordinary hypobromite method. Like every other test, it has its drawbacks, and must be used intelligently in connexion with the clinical symptoms and other tests. As the result of using it in over 10,000 patients suffering from various grades of nephritis it may safely be said that it is exceedingly useful as a simple means of ascertaining the state of the kidneys. That it possesses the advantage of indicating lesions of a much slighter degree than are detected by estimation of blood urea is obvious from the results of experimental work. In a large number of cases of acute nephritis in which recovery was slow and the blood urea was considerably raised, parallel estimations of blood urea and urea concentration power were carried out. It was found that long after the blood urea had gone back to normal the urea concentration test gave evidence of defective kidneys. It was, of course, impossible to imagine that the kidneys had quite recovered when the blood urea became normal, and there is little doubt that the "urea concentration test" will detect defective kidneys long before the condition is sufficiently severe to produce an increase of blood urea. If the test shows a concentration of urea over 2.5 or 3 per cent. it is quite certain that the kidneys are efficient, and this has again and again been demonstrated in cases of supposed uraemia. In each instance in which the test gave a urea percentage of 2.5 or over the supposed uraemia turned out to be something else. Indeed, in actual uraemia the test generally gives concentrations of urea in the region of 1 per cent. or lower.

Of all the procedures utilized in renal investigations from the clinical side, this simple test appears to give more information in the majority of cases than any other. The 15 grams of urea given by mouth never produce any bad effects; indeed, it may be safely given to patients showing symptoms of uraemia. Urea possesses a somewhat unpleasant metallic taste, but this may be overcome to some extent by the use of a little tincture of orange.

Ambard's Coefficient of Renal Excretion.

Ambard's so-called coefficient of urea excretion has been extensively employed, especially in America and on the Continent, as a means of estimating the functional activity of the kidneys. Ambard deduced the following constant K, which in normal healthy subjects he found to be 0.06 to

0.07; in patients with renal inefficiency it is claimed that variations in the K value indicate the extent of the damage. Ambard's formula is as follows:

$$K = \frac{Ur}{\sqrt{D \times \frac{70}{W}}\ \sqrt{\frac{C}{25}}}$$

Where Ur = Grams of urea per litre of blood.
D = Grams of urea excreted in twenty-four hours.
W = Weight in kilos.
C = Grams of urea per litre of urine.
70 = Standard body weight in kilos.
25 = Standard concentration of urea in grams per litre urine.

This imposing formula has been modified in America by F. C. MacLean, who makes use of the expression:

$$K = \frac{Ur}{\sqrt{\frac{D}{W}}\ \sqrt{C}}$$

Using this formula, K in normal individuals varies from 0.20 to 0.36.

Now, in examining either of these formulae, it is quite clear that the simplest way to influence K is to change the value of the numerator. On the other hand, fairly large changes in the figures making up the denominator produce but little effect, since they become active only in terms of their square or fourth root. Thus, in chronic nephritis, concentration of urea (C) is a very important factor, but in the formula comparatively large variations in C produce little effect on K. It would seem that the formula is of little value except in cases where the blood urea (Ur) is above normal, and in such cases it is unnecessary to work out a complicated mathematical problem, since the simple estimation of blood urea alone supplies us with as much information as the formula will give. In short, for practical clinical purposes, these elaborate expressions are, in my opinion, of little or no value.

Urea Concentration Factor.

Though elaborate mathematical calculations such as the above do not afford us much help, a good deal of useful information may be obtained by comparing the concentration of the urea of the blood at a given time with that in the urine secreted over a short period. Normal kidneys are capable of concentrating urea so that the urine contains 70 times or more the amount contained in an equal volume of blood. Thus, if a sample of blood is found to contain 20 mg. urea per 100 c.cm., and a sample of urine collected during the same hour as the blood was drawn shows a concentration of 1,400 mg. per 100 c.cm. (1.4 per cent.), it is obvious that the blood urea as it appears in the urine has been concentrated 70 times. This number represented by

$$\frac{\text{Mg. urea per 100 c.cm. urine}}{\text{Mg. urea per 100 c.cm. blood}}$$

may be low in nephritis, and when it gets below 10 the condition is grave. To avoid confusion with the "urea concentration test" this number might be referred to as the "urea concentration factor."

Salt Tolerance Tests.

The retention of sodium chloride in the system is at once indicated by the presence of oedema, so that it is practically never necessary to perform a test for salt tolerance. Besides, it is quite useless to give a large dose of sodium chloride by mouth and ascertain how much of this is excreted in a given time, for the result obtained will depend quite as much on other factors as on the condition of the kidney. The body cells require a fluid containing about 0.6 per cent. chlorides (expressed as sodium chloride), and any marked change in this value is incompatible with life. When, therefore, the kidney is unable to excrete salt, a certain amount of water will be retained in the body in order to give the necessary salt concentration; if, on the other hand, the difficulty is to excrete water, then a certain amount of salt will be retained to give this optimum concentration. It is difficult, if not impossible, in any given case in which salt is retained, to say whether the primary defect is inability to excrete salt or inability to excrete water. Either condition produces the same result—oedema and ascites. If no oedema is present, we may be certain that salt is excreted all right. These observations are of importance, for it is no uncommon occurrence for nephritic patients to be limited to salt-free diets in cases where no oedema exists.

Relation of Blood Pressure to Renal Damage.

Generally speaking, as will be seen from the results quoted later, the more serious the renal damage the higher the blood pressure. This, however, is by no means always the case, and it is not uncommon to have very badly damaged kidneys without much increase in blood pressure. Comparatively frequent also is the case where the patient shows a decidedly high blood pressure, often accompanied by other evidence of cardio-vascular degeneration and slight albuminuria. Such cases are generally diagnosed as primary interstitial nephritis with secondary cardio-vascular changes. In many such patients it is found that the kidneys are comparatively unaffected, and I have on several occasions examined patients who were supposed to be suffering from uraemia and in whom the kidneys proved to be quite efficient. The subject is too extensive to be discussed here, but it is most important from the prognostic point of view to remember that clinical symptoms which suggest uraemia in conjunction with high blood pressure may not be uraemic at all, and that such patients may have comparatively healthy kidneys. In every case of suspected renal deficiency it is, however, most important that the condition of the cardio-vascular system should be thoroughly investigated.

General Survey of Methods of Examination of Renal Patients.

The above appear to me to be the most useful methods at present at our disposal for ascertaining the state of the renal function. Many other tests have been suggested from time to time, but they do not give us any information beyond what can be obtained by the means described. From the clinical standpoint we really do not require any more tests. We have too many already. What we need is some simple combination of tests which will give the necessary information and which we can all use with a view to increasing our knowledge of their real value. I would suggest the following scheme for the examination of a renal case; with the exception of the determination of blood urea and the estimation of diastatic activity, all the tests can easily be carried out by the general practitioner with the simplest of apparatus. As the result of a very large experience in testing renal cases I think I can state with reasonable certainty that all the information required can be obtained by means of the simpler tests described without carrying out either the blood urea or diastatic tests.

A study of the cases quoted below will show that the presence of protein and casts is no evidence of the extent of renal damage. Albumin may be present, even accompanied by casts, in quite efficient kidneys. To the relative amounts of albumin and globulin little importance is to be attached, except perhaps occasionally in the case of children and young people.

Scheme for the Examination of a Renal Case.

1. Estimation of blood urea or non-protein nitrogen.
2. Examination of urine (twenty-four hours specimen) for protein, casts, blood, pus, etc. Estimation of diastatic activity.
3. Urea concentration test.
4. Condition of cardio-vascular system (blood pressure, condition of arteries, position of apex beat, nature of second aortic sound).
5. Presence or absence of oedema.
6. General condition of patient.

The accompanying table (p. 428) gives the results obtained in 20 patients who were sent to be examined for nephritis. No blood urea estimations were done, yet the condition of the kidneys is obvious, and blood urea estimations would give little further information.

Renal Tests in Surgical Work.

One of the most important parts played by modern renal tests is the estimation of renal function in patients suffering from certain genito-urinary diseases such as enlarged prostate.

When operative interference becomes necessary in such cases the result depends to a great extent on the state of the kidneys. All these patients should be carefully examined for renal function, for it often happens that a

Table showing Results in Twenty Patients Examined for Nephritis.

No.	Protein.	Casts.	D Value.	Urea Concentration Test.	Urine Passed in Second Hour.	Blood Pressure.	Remarks.
					c.cm		
1	+++	Numerous Ep., Hy., Gr.	2	1.2	56	168	Bad.
2	Very faint trace	Nil	10	1.9	132	140	Good; slight diuresis in second hour.
3	++++	Some Ep., Hy., Gr.	1	1.1	104	145	Bad.
4	+	Few Hy., Gr.	10	2.3	52	148	Good.
5	Nil	Nil	20	3.5	35	140	Kidneys efficient.
6	++	Nil	20	1.8	80	136	Fairly good.
7	+	Few Ep.	20	2.3	70	143	Good.
8	+	Few Hy. and Ep.	15	3.5	45	145	Good.
9	+	Few Ep.	6.6	1.2	50	170	Bad.
10	+++	Hy. and Ep.	10	2.6	40	132	Fairly good.
11	+++	Numerous Hy. and Ep.	6.6	3.1	48	128	Very good.
12	Nil	Nil	10	1.4	220	150	Good; diuresis in second hour.
13	Nil	Nil	15	3.8	40	136	Kidneys efficient.
14	Trace	Few Hy.	4	1.1	82	160	Bad.
15	Trace	Nil	6.6	2.5	70	124	Good.
16	+++	Hy., Ep., Gr.	6.6	1.5	75	156	Fair.
17	+	Few Ep.	5	3	62	114	Good.
18	Nil	Nil	10	3.1	35	112	Kidneys efficient.
19	+++	Hy., Gr., Ep.	10	4	80	124	Good.
20	+++	Ep. and Gr.	10	2.9	60	110	Good.

Ep. = Epithelial casts; Hy. = Hyaline cysts; Gr. = Granular casts.

temporary inadequacy in renal action is present which clears up under careful non-operative treatment. An operation during the stage of renal inefficiency would very probably end in disaster, while at a later period, when the kidney condition improves, surgical procedures may be undertaken with every chance of success. In no case should an operation necessitating a general anaesthetic be undertaken on any patient whose blood contains 100 mg. or more of urea.

There is little doubt that in this sphere alone careful examination of the renal system has saved hundreds of lives. Probably many obscure deaths after surgical operations are due to unsuspected renal inefficiency.

II.—FRANCIS D. BOYD, C.B., M.D.,

Professor of Clinical Medicine, University of Edinburgh.

To the clinician the functional capacity of an organ is of the utmost importance, and especially is this the case in renal disease, where the estimation of function is so helpful in giving an accurate prognosis and in regulating scientific treatment. It has long been recognized that in renal disease, especially in the chronic interstitial variety, there is an increase in the quantity of urine excreted during the night as compared with the normal. The elimination of waste products by the kidneys is inefficient, and, as a consequence, their work being insufficient during the day, they must work by night to keep up excretion—hence the increased excretion by night.

It has been advised, as an efficiency test of renal function, that two-hourly samples of urine be collected during the day period—7 a.m. to 9 p.m.—and the whole urine from 9 p.m. to 7 a.m. next morning. Measuring the quantity and taking the specific gravity of each sample may give information of value. The normal person will eliminate amounts of urine varying very greatly in volume during the day, depending on the amount of fluid taken. Moreover, it will be eliminated promptly after it has been ingested. During the night period of ten hours but little, if any, more urine will be eliminated than during any of the two-hour periods of the day. The specific gravity of the urine will also vary widely in the samples, from 1006 to 1025 or more. There is a similar response to meals. The sclerotic kidney, in proportion as it is diseased, will eliminate practically the same amount of water every two hours, irrespective of what may have been ingested, and the quantity during the night period may equal or exceed the total excretion during the day.

This tendency to uniformity in the amount of urine and specific gravity, and in the failure or delay in responding to the ingestion of food, has been known as "fixation" of the kidney, which means that the kidney is already working under high pressure and is unable to respond promptly to the additional work thrust upon it by the ingestion of food or fluid. Now, were this functional test reliable, it would be ideally simple for the practitioner, but unfortunately it is not. Dr. Malcolm Smith has been working at the point in my clinic, and we find that in a large number of cases the results are not constant. Fig. 1 is from an example of glomerular nephritis occurring in the course of subacute bacterial endocarditis, where the results are positive and where the uniformity of excretion is well shown. In Fig. 2, however, from a case of chronic interstitial nephritis with high blood pressure and nitrogen retention, the results are similar to those obtained in the normal hospital patient. We have had quite a number of the latter examples, so one fears that one cannot place much reliance upon the test.

Of the tests of renal efficiency by estimation of the capacity for excretion of medicinal substances by the tubules, after a considerable experience, we have discarded the potassium iodide test as not being sufficiently reliable. The most useful of such tests is the phthalein test of Rowntree and Geraghty. Dr. Maclean has dealt so fully with this aspect of the case that I would just wish to show a table from a few of our cases.

TABLE I.

No.	Case.	Phthalein Excretion.	Result.
1	Acute nephritis	61	Relieved.
2	Acute nephritis	65	Relieved.
3	Subacute nephritis	48	Improved.
4	Subacute nephritis	64	Improved.
5	Chronic interstitial nephritis	68	Improved.
6	Chronic interstitial nephritis	Not estimable	Death.
7	Chronic interstitial nephritis	Not estimable	Death.
8	Chronic interstitial nephritis	63	Improved.
9	Chronic diffused nephritis	68	Improved.
10	Chronic interstitial nephritis	34	Improved.
11	Chronic interstitial nephritis	68	Improved.
12	Chronic interstitial nephritis	73	Improved.
13	Chronic interstitial nephritis	50	Improved.
14	Chronic interstitial nephritis	25	Improved.
15	Chronic diffused nephritis	18	Improved.
16	Chronic diffused nephritis	22	Improved.
17	Chronic nephritis	34	Improved.
18	Chronic nephritis	12	Improved.
19	Chronic nephritis	31	Much improved.
20	Chronic nephritis	48	Much improved.
21	Chronic nephritis	54	Much improved.
22	Chronic interstitial nephritis	Nil	Death.
23	Acute nephritis	32	Cured.
24	Acute nephritis	19	Relieved.

This table would seem to show that improvement may take place even when the phthalein excretion is markedly low.

Working with Wohlgemuth's method, we have done a considerable number of observations on the enzyme content of the urine in renal disease, as a test of renal function, but we come to the conclusion that other

factors such as pancreatic function, are of such importance as to render the test insufficiently reliable as an estimation of renal function.

The estimation of the non-protein nitrogen of the blood as an indication of renal activity, and as a guide to dietetic treatment in nephritis, cannot be over-estimated. In a normal individual, on a mixed diet, the non-protein nitrogen of the blood has been placed by Folin and Dennis at 22 to 26 mg. per 100 c.cm. of blood, but in the ordinary hospital patient it will probably be found rather higher than this. In the nephritic the capacity of the kidneys for the excretion of waste nitrogenous bodies will vary very much, and each case should be studied and treated according to the findings. Table II shows the result of

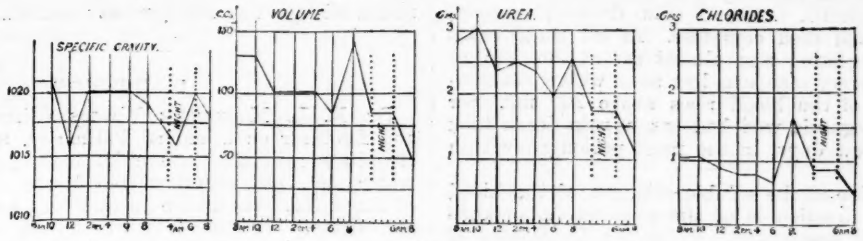


FIG. 1.

TABLE II.

No.	Case.	Non-protein Nitrogen in mg. per 100 c.cm.	Result.
1	Acute nephritis	46	Cured.
2	Acute nephritis	41	Cured.
3	Chronic diffused nephritis	32	Improved.
4	Subacute diffused nephritis	42	Improved.
5	Subacute nephritis	41	Improved.
6	Chronic nephritis	41	Improved.
7	Acute nephritis	45	Cured.
8	Chronic nephritis	36	Improved.

the estimation of the non-protein nitrogen in a number of cases where the findings were comparatively low.

In these cases the non-protein nitrogen of the blood was under 50 mg. per 100 c.cm. of blood, and in every case justified a fairly favourable prognosis.

In the second class of nephritics, those who show a figure of blood nitrogen from 50 to 100 mg. per 100 c.cm. of blood, there is very definite renal inadequacy with serious nitrogenous retention and indications for rigorous protein-free diet. In most of such cases the prognosis is bad.

Of the cases recorded in Table III, speaking generally, one would say that when the soluble nitrogen of the blood rises to between 50 and 100 mg. per 100 c.cm. there is grave renal inadequacy calling for a stringent protein-free diet, and even then the prognosis is grave. Two of the cases where the reading is high improved. Case 5, in which the non-protein nitrogen was 98 mg. per 100 c.cm., gave a positive Wassermann reaction. Under anti-syphilitic treatment improvement was marked, and before discharge from hospital the nitrogen content of the blood was practically normal. Case 12, where the nitrogen stood at 94 mg. per 100 c.cm., the phthalein excretion in two hours at 12 per cent., and the Wassermann negative, was of interest as one would have said that the prognosis here was really bad, but under the most rigid protein-free diet improvement took place and the patient was discharged from hospital relieved of symptoms.

At times the non-protein nitrogen of the blood will show a very high figure. Speaking generally, it may be stated that if the non-protein nitrogen rises above 100 mg. per 100 c.cm. the duration of the illness may be reckoned in days — seldom in weeks.

TABLE III.

No.	Case.	Non-protein Nitrogen in mg. per 100 c.cm.	Result.
1	Nephritis, uraemia	74	Death.
2	Cardiac disease, albuminuria	59	Death.
3	Subacute diffused nephritis	53	Death.
4	Chronic interstitial nephritis	80	Death.
5	Subacute diffused nephritis	98	Improved.
6	Subacute diffused nephritis	53	Improved.
7	Arterio-sclerotic kidney	52	Death.
8	Chronic nephritis, uraemia	60	Improved.
9	Chronic interstitial nephritis, uraemia	54	Death.
10	Chronic nephritis	53	Improved.
11	Chronic nephritis	66	Improved.
12	Chronic nephritis	94	Improved.
13	Chronic nephritis	63	Improved.
14	Chronic nephritis	57	Greatly improved.

Table IV shows the figures given in a number of cases, the blood being taken within a few hours of their coming under observation. All the cases were examples of uraemia. Cases 2, 4, 5 and 7, showed convulsive phenomena. Case 1 died comatose without convulsions. Case 3 was drowsy for some days before death, and there were marked

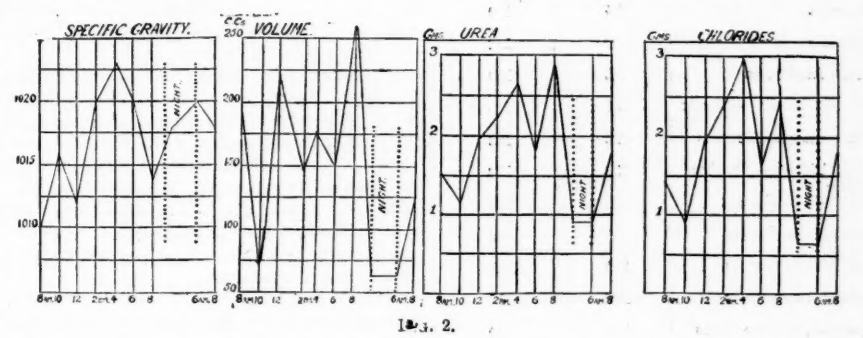


FIG. 2.

TABLE IV.

No.	Case.	Non-protein Nitrogen in mg. per 100 c.cm.	Result.
1	Nephritis, uraemia	220	Death.
2	Nephritis, uraemia	160	Death.
3	Nephritis, endocarditis	123	Death.
4	Tuberculosis of urinary tract, uraemia	228	Death.
5	Chronic interstitial nephritis, uraemia	139	Death.
6	Chronic interstitial nephritis, uraemia	139	Death.
7	Chronic interstitial nephritis, uraemia	150	Death.
8	Acute nephritis, oedema of glottis	103	Death.
9	Chronic nephritis, uraemia	120	Death.

alimentary symptoms pointing to uraemia. Case 7 was not so definitely uraemic as the others, and died of oedema of the lungs after tracheotomy had been performed for oedema of the glottis. Case 8 was drowsy, restless, and asthmatic, and died comatose. In all these cases the phthalein excretion was almost *nil* at the end of two hours. In every case one has seen where the non-protein nitrogen of the blood rises above 100 mg. per 100 c.cm. the prognosis was bad—as a rule death took place within a few days, in the most prolonged within two weeks.

The consideration of the soluble nitrogen of the blood as a test of renal function is of the greatest importance from a therapeutic standpoint. Without a knowledge of the proportion of non-protein nitrogen of the blood the adequate dietetic treatment of a case of nephritis is impossible. Given that knowledge, one will find that if the soluble nitrogen content of the blood is raised, a rigid protein-free diet will have a definite beneficial effect in diminishing the waste products in the circulating blood and in relieving symptoms. But this rigid protein-free diet is not always either necessary or desirable, and it is only by a consideration of the soluble nitrogen content of the blood that one is able to say whether it be necessary or no.

It is interesting to note that no conclusion as regards renal function can be drawn from an estimation of blood pressure. Table V shows the soluble nitrogen of the blood with the systolic blood pressure in the number of nephritics.

TABLE V.

Case.	Disease.	Nitrogen of Blood in mg. per 100 c.cm.	Systolic Blood Pressure.
1	Acute nephritis	46	134
2	Acute nephritis	41	104
3	Chronic diffused nephritis	32	140
4	Subacute nephritis	42	94
5	Subacute diffused nephritis	41	120
6	Chronic interstitial nephritis	41	220
7	Nephritis, uraemia	74	140
8	Subacute nephritis	59	122
9	Chronic diffused nephritis	53	160
10	Cerebral haemorrhage, chronic nephritis	80	170
11	Subacute diffused nephritis	98	172
12	Arterio-sclerotic kidneys, cerebral haemorrhage	52	170
13	Chronic interstitial nephritis	60	218
14	Chronic interstitial nephritis	54	180
15	Chronic interstitial nephritis	220	123
16	Chronic interstitial nephritis	160	88
17	Subacute nephritis, endocarditis	123	130
18	Chronic interstitial nephritis	139	192
19	Chronic interstitial nephritis	190	175
20	Subacute nephritis	57	110
21	Subacute diffused nephritis	41	139
22	Subacute diffused nephritis	56	130
23	Chronic interstitial nephritis	88	160
24	Subacute diffused nephritis	59	95
25	Chronic interstitial nephritis	162	190
26	Subacute diffused nephritis	36	110
27	Chronic interstitial nephritis	94	179
28	Orthostatic albuminuria	42	137
29	Chronic interstitial nephritis	72	205
30	Chronic interstitial nephritis	66	210
31	Chronic interstitial nephritis	36	140
32	Chronic interstitial nephritis	53	129

Study of this table shows that there is no relation between nitrogen retention and systolic blood pressure; that, in fact, systolic blood pressure may be markedly raised without any nitrogenous retention.

DISCUSSION.

Dr. R. L. MACKENZIE WALLIS (Chemical Pathologist and Lecturer on Chemical Pathology, St. Bartholomew's Hospital) said that the chief tests he used were the water test, estimation of blood urea, diastase content of the urine, urea concentration test, and sugar in blood and urine. No one test was of value by itself, but collectively these tests were of value both in diagnosis and prognosis. Their application to cases of albuminuria in pregnancy had shown that the tests were of distinct value in diagnosis. In eclampsia and toxic kidney conditions in general the blood urea was normal, the diastase content of the urine light, the urea concentration test normal. The sugar in the blood was invariably subnormal, yet in the urine the normal urinary sugar was high. The cases of parenchymatous nephritis in pregnancy, on the other hand, gave almost exactly opposite results—namely, a high urea content of the blood, low urinary diastase, and a low urea concentration in the urine. The blood sugar content was high, but varied according to the severity of the renal damage. Estimating the normal sugar content of the urine, it was found that, like the diastase content of the urine, it was invariably low. There was a definite correspondence between the amount of sugar in the blood and sugar in the urine in cases of renal insufficiency.

Dr. WILLIAM MACADAM (Lecturer in Pathology, University of Leeds) confined his remarks chiefly to some points of interest arising out of the investigation of renal function in a series of over fifty cases of obstruction in the lower urinary tract, in most instances due to prostatic enlargement.

In the investigation of general medical cases, the speaker said he had been impressed by the fact that excretion was not delayed in all forms of kidney disease, but that it was usually normal or indeed increased in cases of parenchymatous nephritis. Although this fact was pointed out by Maclean,[1] it appeared to have been lost sight of in several more recent papers on the urea concentration test, as also in the application of the various aniline dye tests.

In surgical conditions of obstruction in the lower urinary tract, urinary tests appeared to be unreliable as a guide to the state of the renal excretory function. This applied especially to cases associated with chronic cystitis and residual urine. Likewise the diastatic value of the urine was an uncertain guide under such conditions. Most of his observations had therefore been confined to blood analysis, chiefly the quantitative estimation of the urea nitrogen, creatinin, and the non-protein nitrogen.

Dr. MacAdam had found the estimation of the urea nitrogen to give the most useful and valuable findings. The non-protein nitrogen values had served simply to confirm the urea findings. The estimation of the creatinin in the blood was the least valuable in actual practice. Increased creatinin was found only when there was a marked rise in the urea and non-protein nitrogen values, while the absolute range of variation in the amounts of creatinin was very small. This nitrogen retention in the blood ceased rapidly when the mechanical obstruction in the lower urinary tract had been overcome and free drainage established. In a number of cases the urea nitrogen fell from 80 to 200 mg. per 100 c.cm. of blood to 20 to 30 mg. after seven to fourteen days of suprapubic drainage, the patients being kept on a diet of fairly constant nitrogenous content. This rapid fall in the blood urea nitrogen was exceedingly striking. It appeared to point to the fact that there might be marked defect in the excretory function of the kidneys without chronic interstitial changes in the renal parenchyma, and due solely to the mechanical effects of obstruction in the lower urinary tract. On the other hand, these findings showed that prolonged and progressive mechanical obstruction to the

[1] Maclean: *Quart. Journ. Med.*, 1919, vol. xii, p. 347.

outflow of urine was not a factor of great importance in the production of chronic nephritis, whether interstitial fibrosis, or fibrosis and lamination of the glomeruli. It was accepted that an appreciable increase in the urea nitrogen of the blood occurred only when the effective renal tissue was reduced to less than one-fourth of the total kidney substance. In cases of obstruction of the lower urinary tract a condition of marked nitrogen retention occurred which was not necessarily due to gross changes in the renal parenchyma. It appeared to be due to the mechanical obstruction acting on the kidney as a whole, and, in addition to the production of varying grades of hydronephrosis, there was a direct interference with filtration through the glomeruli without any gross changes in their structure. Correlation with the clinical condition of the cases had shown that the estimation of the blood urea nitrogen was of considerable practicable value as a guide to the functional renal efficiency in obstruction of the lower urinary tract. Mr. J. F. Dobson, whose cases the speaker had had the privilege of investigating, had shown in the Arris and Gale Lecture, 1921,[2] the advantage of preliminary suprapubic drainage, and of waiting until the blood urea nitrogen was within normal limits before carrying out prostatectomy.

Dr. D. WELLS PATTERSON (Assistant Physician, Royal Victoria Infirmary, Newcastle-upon-Tyne) said that for some months past he had, in the Newcastle War Pensions Hospital, been employing tests for renal efficiency as a routine proceeding. The tests used had been:

(1) The water excretion test.
(2) Fixation of specific gravity.
(3) Urea concentration.
(4) Estimation of diastase value.
(5) Estimation of excretion of chlorides.

He had come to the conclusion that, in chronic parenchymatous nephritis especially, the regular and careful estimation of the urea concentration and of the diastase value gave most useful information as to the progress of the case and helped the formation of an opinion as regards prognosis and as to the amount of protein in the diet which could be safely allowed. It was interesting to note that the cases admitted with a definite history of war nephritis showed that a very considerable amount of recovery had taken place as regards their renal efficiency, but in no case could the recovery be considered to be complete; there was, however, definite evidence of progressive cardio-vascular deterioration shown by increase in the blood pressure and by enlargement of the heart. It appeared to him that any estimate as to the future of these cases must take into consideration not only the amount of renal efficiency but must also be based on the most careful examination possible as to the condition of the cardio-vascular system.

Dr. R. ERRINGTON (Sunderland, D.C.M.S. Northern Region, Ministry of Pensions) said that the urea concentration and diastatic tests in the estimation of renal efficiency carried out on the lines suggested by Professor H. Maclean had been a great help in estimating the renal efficiency in ex-soldiers; at the same time it was essential to bear in mind that no single test was infallible in itself; a series of tests must be performed and a thorough physical examination made also. The presence or absence of protein in the urine was chiefly helpful in deciding the type of nephritis, and must not be taken as an indication of the efficiency or inefficiency of the kidneys. He had found, after an examination of very many cases of chronic nephritis occurring in ex-soldiers, that the results of the urea concentration and diastatic tests had invariably been borne out by physical examination. Only where the taking of 15 grams of urea caused marked diuresis was the physician apt to be led astray; in these cases dependence must be placed on other tests.

Professor MACLEAN, in reply, said he agreed in the main with the views expressed by different speakers. He could not, however, corroborate Dr. MacAdam's experience that the tests used were unreliable in cases of mechanical obstruction to the kidney. He had found them of great value in surgical cases where there was obstruction to the outflow of urine.

[2] Dobson, BRITISH MEDICAL JOURNAL, 1921, vol. i, p. 289.

SECTION OF OTO-RHINO-LARYNGOLOGY.

G. WILLIAM HILL, M.D., B.Sc., President.

DISCUSSION ON PROBLEMS PRESENTED BY HAEMORRHAGE IN CONNEXION WITH OPERATIONS ON THE TONSILS.

STATISTICAL RECORDS OF SERIOUS AND FATAL HAEMORRHAGE FOLLOWING OPERATIONS ON THE TONSILS.

BY

A. BROWN KELLY, D.Sc., M.D.,
Surgeon for Diseases of the Throat and Nose, Victoria Infirmary, Glasgow.

OF all the operations performed by medical men the commonest is that for the removal of tonsils and adenoids. The subjects may be suffering from signs or symptoms of interference with the physical and mental development, of a lowered state of resistance of the respiratory or digestive system, of implication of the ear, or of a systemic infection, and as a consequence may be reduced to a condition of semi-invalidism. Nevertheless, operation is rarely urgent, but usually a matter of expediency. These two facts—namely, the frequency of the operation and the comparatively healthy state of the majority of those undergoing it, make it imperative that we choose the best mode of procedure and eliminate as far as possible all attendant risks.

The most notable risks encountered are those associated with the general anaesthetic when such is used, and post-operative tonsillar bleeding. To-day we are concerned solely with the latter, and it is my duty to deal with the statistics of serious and fatal cases. I do not propose to carry you back to the dark ages preceding the birth of our specialty when the guillotine had not been devised or was still a rare possession. Tonsillotomy as then performed with volsella and bistoury, but without anaesthetic or forehead mirror, is suggestive of inevitable tragedy. Nor shall I detain you with an account of accidents which followed the use of the guillotine during the early years of the specialty. A number of these have been collected and published. I shall begin with the year 1887, which is convenient for my purpose, as that of the publication of the first volume of the *Journal of Laryngology*. In the late eighties and early nineties the usual treatment of enlarged tonsils consisted in removing more or less with Mackenzie's or Mathieu's guillotine. This simple procedure was followed every now and then by dangerous haemorrhage. In the first five volumes of the *Journal of Laryngology* ten such cases are described by nine writers. In one case the patient was a child of 7 years, and the accident was attributed to operating while the tonsils were acutely inflamed. Moure,[1] in relating the occurrence, states that he was unable to find the report of a single case of haemorrhage in a child after tonsillotomy. In the same volume—the fourth—the case of a girl of 14 years is described (Butler[2]) in which the stump had to be ligatured; the bleeding was ascribed to the hard, fibrous state of the tonsils. The other eight cases occurred in adults, mostly young men. Angular scissors were used in one instance (Clarke[3]), in the others a guillotine. Several of the operators, apparently in the hope of lessening the chance of bleeding, had aimed at cutting off "only a slice," or two-thirds of the organ. Haemorrhage set in, as a rule, a few hours after the operation. Styptics, cold and pressure usually failed; torsion, the actual cautery and ligature of the cut vessel occasionally proved effectual. In two cases the common carotid was tied, in one instance without controlling the bleeding; the patient recovered, however, after transfusion.

In the *Centralblatt für Laryngologie*, between January, 1887, and December, 1891, six cases are referred to, mention of which is not made in the *Journal of Laryngology*. I am unable to utilize these abstracts, however, as they are too brief, and the original papers are unobtainable.

A search was also made through the *Archives de Laryngologie* and *Monatsschrift für Ohrenheilkunde* during the five years specified, but without gleaning any fresh cases. It may be mentioned, however, that in an addendum to an abstract in the last-mentioned journal Moritz Schmidt states that he had had severe haemorrhage after tonsillotomy on five occasions, so that for many years he had used the cautery snare, and had not had bleeding of any account in close on 1,000 patients operated on in this manner. The obvious conclusion to be drawn from the reports published during this quinquennium is that tonsillotomy in children is generally quite safe, but in adults it may be followed by profuse haemorrhage which is due to the firm, fibrous condition of the tissues preventing the retraction of the cut vessels, and as a consequence its control is difficult.

In spite of the comparatively rare occurrence of severe bleeding this led not a few to abandon tonsillotomy and to adopt some other procedure—for instance, puncture with the thermo- or galvano-cautery, the electric snare, electrolysis, discission, morcellement or punching, or escharotics. Discussions were held and many papers were published dealing with the respective advantages of these methods, all of which, however, were shown to be occasionally dangerous or to have decided objections. Alarming secondary haemorrhages were reported to have followed the removal of tonsils with the galvano-cautery snare, and even after their reduction with the cautery point.

In the nineties the need of dealing expeditiously with flat and small tonsils led to the introduction of a variety of tonsil punches; these were used alone or in conjunction with the guillotine. Many of us employed the latter procedure in children over a long period with very rarely a haemorrhage to cause anxiety. That the method was not always satisfactory is being borne in upon us now by the return of some of our patients who, as adults, complain of chronic lacunar tonsillitis, frequent quinsy, or a systemic infection.

With the dawn of the new century the harm which the stump of an amputated tonsil could cause was coming to be recognized, and, as a consequence, methods of effecting the total extirpation of the gland were being evolved. It does not fall to me to discuss these, but in considering the risks of bleeding from tonsillectomy it is necessary to distinguish the operation performed with the guillotine in children from that carried out by dissection in adults; further, the latter class should be subdivided into those requiring the operation on account of chronic lacunar tonsillitis, the majority of whom are women, and those, mostly men, in whom the indication is recurrent quinsy. It is chiefly—one might almost say only—in the last class that grave haemorrhages are to be feared. I do not mention the operation by dissection in children, or with the guillotine in adults, for these methods are seldom employed, although, as carried out by some of their exponents, they have much to recommend them.

I shall now consider haemorrhage following tonsillectomy, and in order to compare it with that due to tonsillotomy shall, as in the case of the latter, review the literature during the last quinquennium, from January, 1916, till December, 1920, when enucleation was more extensively practised than ever previously. It is impossible in the time at my disposal to attempt to analyse all the papers bearing on the subject that have been published in this period. I shall therefore refer chiefly to those of which abstracts have appeared in the *Journal of Laryngology*, *Centralblatt für Laryngologie*, or the *Laryngoscope*. The last mentioned journal has been chosen in this connexion, because in America a complication of haemorrhage—pulmonary abscess—has been frequent.

In searching through these volumes it soon becomes evident that single cases of severe haemorrhage are not reported unless a rare condition has existed or been suspected—for instance, a fault in the walls of the blood vessels (Hurd[4]), or an abnormality in the vascular supply of the tonsil (Lawson Whale[5]). On the other hand, writers bring forward large series of operations stating the proportion of severe bleedings and the methods adopted for their control. O. Wilkinson[6] in 200 consecutive tonsillectomies under local anaesthesia had 4 primary haemorrhages, in one of which it was necessary to ligate the vessel, and 3 secondary, of which one called for stitching the tonsillar cavity. Holger Mygind[7] reports that in 171 operations with knife and snare under local anaesthesia secondary haemorrhage took place in 14, or 8 per cent. Most of the patients were between 20 and 30 years of age; none was under 15. The bleeding was slight in 4 cases, moderate in 5, and severe in 4; it could always be checked by tying the vessel. Steiner[8] had 3 cases of secondary haemorrhage in 110 patients whose tonsils had been enucleated. In 70 tonsillectomies, Burger[9] had one bleeding, which was checked by gauze.

McKinney,[10] in a recent series of 50 tonsillectomies by the Sluder method under local anaesthesia in patients aged from 17 to 65, had four haemorrhages. These were comparatively severe in two cases in which the operation had been undertaken on account of renal disease. Beaman Douglas,[11] in his report of the tonsil work at the Post-graduate Hospital for the year 1919, gave some interesting details. Tonsillectomy was performed in 1,560 cases, most of which were in children. The house staff was summoned by the nurse on account of bleeding in 6.5 per cent. of the cases. In nearly every instance mutilation of the pillars or a remnant of tonsil was found. In 90 cases there was slight capillary oozing, which ceased spontaneously or with the application of a cotton pledget. In 6 instances the bleeding vessel had to be clamped, and in only one was more active treatment required—namely, suturing the pillars. In three years there had been four fatalities from haemorrhage. The author states that various modes of operating were employed, and that probably in no other institution with so many men working were such grades of efficiency and inefficiency represented.

In the discussion following the reading of the last two communications some noteworthy experiences were related. Abraham, when unable to check the bleeding at the operation, tied the vessel immediately, and had never had secondary haemorrhage. Hubbard considered ligation unnecessary. During twenty-five years he had removed a large number of tonsils but had not had serious bleeding and had never required to suture. Carter's cases averaged 40 a week. His recent statistics of over 3,000 cases showed neither a death nor an alarming haemorrhage.

Irwin Moore's[12] paper on haemorrhage following the removal of tonsils is probably the most important contribution that has been made to the subject under consideration. It contains, besides statistics, much that might serve as a basis for our discussion. I must restrict myself, however, to the author's own experiences. He states that he has had only one case of alarming haemorrhage amongst the many thousand tonsil operations he has performed. The patient was a boy, aged 6 years, whose tonsils had been enucleated with the guillotine. Profuse bleeding set in two hours after the operation, but was checked by sponge pressure and an injection of morphine and atropine. Irwin Moore had also seen in consultation and partly treated, during the five years preceding the publication of his paper in 1918, seventeen cases of serious or alarming haemorrhage following the removal of tonsils; of these, ten were in adults. In three adults the faucial pillars were sutured; in the others the treatment mentioned as having been used in his own case sufficed.

Tilley[13] in 1919 had had secondary haemorrhage in only two out of 575 cases of enucleation under open ether anaesthesia. Bowen[14] has had several very bad cases but has never seen severe haemorrhage in a small child. Courtenay Yorke,[15] in upwards of 6,000 cases, has never had to stitch the pillars or tie a bleeding point, and very rarely has had to apply a clamp.

On the other hand, Labouré[16] has had to ligature the external carotid in three cases, Kofler[17] in a patient with chronic nephritis and increased blood pressure, Lawson Whale in a girl, aged 13 years, with suspected abnormal tonsillar blood supply, and Panse[18] had a fatal haemorrhage in a lad of 17 with cardiac disease; the greatly swollen submaxillary gland was stated to have been injured during enucleation.

I now beg to direct your attention to a serious sequel of tonsillar haemorrhage—namely, abscess of the lung. C. W. Richardson[19] in 1912 drew attention to the occurrence of this complication after operations on the tonsils and upper air passages. Within the last five years a considerable number of cases following tonsillectomy have

been recorded in America. Thus, Simpson and Noah[20] have described two cases; Frank[21] has reported three, and by inquiry has learned of fifteen others; Koplik has had three in his service; Yankauer has seen four; Dean, Scrutton[22] and Beaman Douglas have had one each; Scudder, several; and Manges,[23] nine. This list is not exhaustive.

One of the most striking contributions to the subject is that of Manges, who, in his capacity as a physician, saw nine cases in one year in Mount Sinai Hospital. The mortality was 11 per cent. Resection of a lobe of a lung was needed in one case and operation for pneumothorax in another. Further, Wessler states that 28 per cent. of the cases of pulmonary suppuration that came to the *x*-ray department of this hospital were due to tonsillectomy.

Two explanations have been given of the mode of origin of pulmonary abscess after tonsillectomy. It has been attributed to the aspiration of blood containing septic matter squeezed out of the crypts during operation. This view is supported by the following facts: Almost all of the patients were operated upon under general anaesthesia while lying on the back; in the majority signs and symptoms developed within thirty-six hours; the abscess was solitary, and, as a rule, formed in the lower or middle lobe of the right lung.

According to the other view septic thrombosis of the veins in the tonsillar bed is followed by pulmonary infarction. This explanation accounts for a minority of the cases in which there is no trouble till after the lapse of from four days to two weeks. It is easily conceivable how an affection of the latter class setting in about a fortnight after tonsillectomy, when the patient has passed from under our care and returned home, may never be suspected as due to the operation.

I have had one case of lung abscess following tonsillectomy. The physician in charge of the patient doubted the connexion, but in spite of this and of certain obscure features, I regard the abscess as a sequela of the operation. The patient, a lady aged about 30, had her tonsils dissected out under local anaesthesia. There was no trouble or special bleeding at the operation, but on visiting her in the evening I learned that she had vomited blood thrice, and on examination I found a clot in the left tonsillar fossa. I might mention, in view of what subsequently transpired, that she fell sound asleep before I left her room. There was no further bleeding, but the left side of the throat kept sore. On the second day after operation her temperature rose, and on the fourth day it reached 104.8°. She then complained of pain in the chest and a small patch of friction was detected. Ten days later she was almost well, but still had discomfort and a membranous patch at the site of the left tonsil. I subsequently learned that about a week later there was a recrudescence of the pneumonia with effusion into the pleural cavity and that a rib was resected. She made a good recovery. In this case there was no aspiration of blood during the operation, and, although so somnolent, it could not have taken place afterwards, yet the pain in the chest was complained of on the fourth day. An embolic origin seems most probable and the "recrudescence" may have been set up by a fresh focus.

What are we to make of the various facts and statistics that have been submitted to you? Deductions from statistics are proverbially unreliable, and it appears to me that they would be specially so if based on the work of a number of men whose experience, manipulative dexterity, care, judgement and temperament varied greatly. The statistics prove at least that the operations in vogue for the removal of tonsils, when carried out competently in suitable subjects are very rarely followed by serious haemorrhage. In comparing tonsillotomy with tonsillectomy, it is not for one who during many years employed the former method with what appeared to be good results to decry it. My own impression, however, and that of my colleagues is that in children the removal of tonsils by the method of Whillis and Pybus is followed by rather less bleeding than we experienced when using the Mathieu guillotine and punch. My experiences of severe haemorrhage in children have been few and scarcely noteworthy; so far I have not required to employ special measures for its control. The most persistent bleedings I have had were in soldiers whose tonsils had been removed by dissection because of recurrent quinsy. In all of them the oozing ceased spontaneously, but not without considerable loss of blood. On only one occasion have I found it advisable to stitch the pillars; the patient was an adult male whose tonsils had been dissected out sixteen hours previously. This infrequency of the need of adopting special measures to check bleeding is not exceptional. I have asked several laryngologists, each of whom must have operated upon thousands of cases, as to their experience in this respect. One with a long and large record of work had stitched the pillars three times; several had done this once or twice, but most had never required to resort to any special treatment.

After all has been said grave bleeding must occasionally follow the removal of tonsils from causes over which the surgeon has no control, for instance, an abnormal vascular supply. The surprising fact is the rarity of its occurrence, and in this we must surely recognize the foresight of a kind Providence in placing the tonsils so as to make them easy of access, and acclaim man some credit in designing ingenious and safe methods for their removal.

REFERENCES.

[1] Moure, *Journ. of Laryngology*, 1890, p. 341. [2] Butler, ibid., 1890, p. 71. [3] Clarke, ibid., 1889, p. 23. [4] Hurd, ibid., 1917, p. 76. [5] Lawson Whale, BRITISH MEDICAL JOURNAL, 1919, i, p. 637. [6] Wilkinson, *Laryngoscope*, 1917, p. 677. [7] Holger Mygind, *Centralbl. f. Laryng.*, 1918, S. 32. [8] Steiner, ibid., 1919, S. 103. [9] Burger, ibid., 1920, S. 144. [10] McKinney, *Laryngoscope*, 1920. [11] Beaman Douglas, ibid., 1920, p. 476. [12] Irwin Moore, *Practitioner*, 1918, i, p. 334. [13] Tilley, BRITISH MEDICAL JOURNAL, 1919, i, p. 781. [14] Bowen, ibid., 1919, ii, p. 435. [15] Courtenay Yorke, ibid., 1920, ii, p. 318. [16] Labouré, *Centralbl. f. Laryng.*, 1918, S. 194. [17] Kofler, ibid., 1919, S. 131. [18] Panse, ibid., 1919, S. 294. [19] Richardson, *Laryngoscope*, 1916, p. 1001. [20] Simpson and Noah, *Centralbl. f. Laryng.*, 1920, S. 185. [21] Frank, *Laryngoscope*, June, 1917. [22] Scrutton, ibid., January, 1917. [23] Manges, Ibid., 1916, p. 1056.

CONDITIONS PREDISPOSING TO HAEMORRHAGE IN TONSIL OPERATIONS:

CONTRAINDICATIONS TO OPERATION AND PROPHYLACTIC MEASURES.

BY

JOHN F. O'MALLEY, F.R.C.S.,

Surgeon, Ear, Nose and Throat Department, University College Hospital.

SOME degree of haemorrhage is an inevitable part of any operation on the tonsils in which their nutrient vessels are severed. In the average case the bleeding ceases in a few minutes, and the total loss of blood is within fairly moderate limits. During 1912 and 1913 I made observations[1] as to the average blood loss from tonsil and adenoid operations in 1,600 consecutive cases, 1,510 of whom were under the age of 14; eighty were over this age, and only four over 30. The ordinary loss for the combined operation in patients under 14 lay between 2½ and 4 oz., and for patients over 14 from 3½ to 5 oz. The operation was complete tonsillectomy with the writer's guillotine,[2] under general anaesthesia, the arrest of haemorrhage being spontaneous. This average can be considerably reduced by applying gauze pressure to the cut surfaces immediately.

Haemorrhage beyond this moderate amount and which is sufficient to cause risk to the life of the patient is due to something unusual in the source of bleeding, either anatomical, pathological, or surgical, or to certain factors which inhibit normal clotting and the physiological arrest of haemorrhage. The following scheme indicates most of the conditions which may be present prior to or at the time of operation that are likely to increase the blood loss beyond the average, usually resulting from a technically perfect surgical procedure.

Anatomical.

General.—Age; Sex; short-necked, florid patients; menstruation; menopause; early pregnancy.

Local.—1. Large tonsils.

2. Abnormal vessels. (*a*) Concealed type: Large artery entering tonsil instead of previously dividing. (*b*) Visible type: Pulsating and tortuous ascending pharyngeal, internal carotid, and external carotid; abnormal large superficial veins; angioma of fauces.

Pathological.

Local.—1. Inflammation: Acute tonsillitis; chronic tonsillitis and pharyngitis.

2. Ulceration: Syphilitic, tuberculous, Vincent's angina, actinomycosis.

3. Fibrosis of tonsils: Due to recurring tonsillitis, or to recurring quinsies and abscess. (Erosion of vessels; adhesions.)

4. Innocent tumours: Lymphadenoma.

5. Malignant disease: Sarcoma; epithelioma; endothelioma.

General.—1. Blood states. (*a*) Congenital: Haemophilia. (*b*) Acquired: Purpura; temporary defective clotting due to infective diseases. (*c*) Anaemias (especially secondary). (*d*) Leukaemia.
2. Blood vessel changes. (*a*) Arterio-sclerosis: Syphilis; nephritis; alcoholism; athletics. (*b*) Aneurysm: Internal carotid; external carotid; tonsil vessels (erosion of walls due to abscess).
3. Other conditions. (*a*) Exophthalmic goitre. (*b*) Heart disease.

Contraindications to Operation.

1. Tonsils. (*a*) Acute inflammation and quinsy. (*b*) Ulceration (erosion of vessels). (*c*) Malignant disease.
2. Vessels in tonsil region. (*a*) Pulsating and tortuous ascending pharyngeal, internal carotid, external carotid. (*b*) Aneurysm (of same vessels). (*c*) Angioma of fauces.
3. Blood states (affecting coagulability of the blood). (*a*) Haemophilia. (*b*) Purpura. (*c*) Anaemias. (*d*) Soon after infectious fevers. (Temporary.)
4. Physiological changes related to blood loss. (*a*) Menstruation. (*b*) Menopause. (Temporary.)
5. Other diseases (affecting tissues of vessel walls and vasomotor control). (*a*) Renal disease. (*b*) Cardiac disease. (*c*) Alcoholism. (*d*) Syphilis. (*e*) Thyroid gland toxin. (*f*) Suprarenal gland toxin. (*g*) Pituitary gland toxin.

Prophylactic Measures.

1. In children: Exclude haemophilia—if present, treat. In adults: Exclude diseases mentioned above—if present, treat.
2. Increase coagulability of the blood: Calcium lactate (? useless); horse serum; human blood serum; haemoplastin; coagulose; coagulin (Kocher-Fonia); pituitrin.
3. Increase constriction of vessels in arrest of haemorrhage. (*a*) Adrenaline. (*b*) Pituitrin.

Age.

The influence of this factor is generally admitted, profuse haemorrhage being much more frequent in adults than in children, due to (*a*) increased vascularity, (*b*) fixation of vessel wall (fibrosis), (*c*) disease of vessel wall and increased blood pressure (arterio-sclerosis), and (*d*) conditions which impair: coagulability of the blood temporarily.

Sex.

It is commonly stated that males are more prone to alarming haemorrhages than females. Some writers, such as Lee Cohen,[3] disagree with this view. If one enumerates the cases of dangerous bleeding reported in the literature prior to 1900, males are largely in the majority; but statistics based upon these records are liable to be fallacious, because haemorrhages in males were then more readily reported than others, the presumption being that they were haemophiliacs, and no blame could be attached to faulty technique and other causes. Damianos[4] and Herman,[5] who in 1902 collected records of 150 cases published during the previous sixty years, all of which were alleged to be haemophilia, found on analysis that only 7 were true haemophiliacs and that the bleeding in the remaining 143 was due to a spurting vessel in the wound.

Haemophilia being a rare disease, most recent observers regard the haemorrhage in the above cases as being surgical. Apart from haemophilia, in my opinion sex has no influence up to the age of puberty. Beyond this period females are prone to anaemias and blood changes likely to impair the normal arrest of haemorrhage. Beyond the age of 20, and especially in the fourth decade, males are more prone to diseases of blood vessels associated with alcoholism, nephritis, athletics, and syphilis.

Short-necked, florid patients are usually more full-blooded and bleeding is freer, due to increased vascularity.

Menstruation.

This has a definite influence. Several cases have been reported and referred to by various writers—Cocks,[6] Hill,[7] Irwin Moore,[8] Dunbar Roy (case of adenoids),[9] and others. I had a case six months ago in an otherwise healthy female. She was sent up from the country urgently for operation, without previous consultation, because she wanted to be well for some social event. The actual date of the catamenia and the week preceding it are the danger times for surgical interference; the week following cessation is quite safe. It is usually stated that the surgical haemorrhage may act vicariously for the menstrual period, but this does not explain the phenomenon. A possible explanation is a temporary diminished coagulability of the blood approaching the menstrual time, but many well known authors on gynaecology and obstetrics whose works I consulted do not touch this point. It is a fact that coagulability increases after loss of blood, and possibly a fall in blood pressure, and this may account for the comparative safety of the post-menstrual period. In regard to the menopause the same remarks apply. Early pregnancy is mentioned by Cocks.[6] I have no experience of its effect. Very large tonsil presupposes large nutrient vessels. Such cases often do bleed excessively.

Abnormal Vessels: Concealed Type.

A large calibre vessel may enter the tonsil direct, without first subdividing, which is the usual practice. Rapid loss of blood constitutes the chief danger to life in haemorrhage, hence the importance of the large source of bleeding, such as a large vessel or aneurysm. The loss of 1 lb. of blood in one hour is more serious than that of 4 lb. in twenty-four hours.

Visible Type.

1. Arterial. Tortuous and pulsating ascending pharyngeal, internal carotid, external carotid.
2. Venous and large superficial veins.
3. Angiomata.

Several cases of tortuosity with visible pulsation have been observed, which involved the ascending pharyngeal, internal and external carotid arteries, the loops of these tortuous vessels encroaching upon the field of operation; Skillern,[11] Brown Kelly,[12] Sachs,[13] Hulke,[14] Thompson.[15]

Demme[16] records that for ten years he examined 10,000 cases, at the request of Waldeyer and Franckel, for pulsation in the region of the pharynx, and found it in 200 cases, or 2 per cent., which sounds very alarming. The pulsation seen in these cases is not conclusive evidence that abnormal or unusually large vessels were present in all of them, as pulsation is easily elicited in thin, spare people, by transmission, if the tissues overlying large arteries are crowded on to the latter.

Extra large superficial veins rarely cause unusual bleeding. Angiomata would provide a source of large sudden loss, and therefore should be dealt with before operating on the tonsils.

Inflammation causes greater vascularity, and this predisposes to increased haemorrhage and possibly to defective clotting control. Ulceration, if sufficiently deep to produce changes in the vessel walls, will impair contraction and retraction.

Fibrosis in Tonsils.—This is due to involution, inflammation, or suppuration. Changes produced inside the tonsillar capsule on the arterioles of the gland have no effect on the haemorrhage of tonsillectomy, but increases that of tonsillotomy. The capsule in such cases is often firmly adherent to its bed, especially on the outer aspect, anteriorly, below the level of the large crypt, and these adhesions prevent the contraction and retraction of cut vessels by fixation of their sheaths. A cleanly cut vessel so fixed is liable to slip its clot on any increase in blood pressure, and would therefore be a source of secondary haemorrhage.

Suppuration.—This has at times caused erosion of tonsillar and extratonsillar vessels and severe haemorrhage, spontaneously, and also on opening the abscess. Somers,[17] Jenkins,[18] Hammond and Lord,[19] Newcomb[20] collected details of 51 such cases, 28 of which proved fatal. Partial erosion would also lead to changes in the vessels which predispose to defective arrest of bleeding in a subsequent operation. It is also conceivable that such an erosion may produce an undiscovered aneurysmal enlargement in a tonsillar vessel, comparable to that seen in pneumonic tuberculous cavities, which would prove a source of alarming haemorrhage during an operation. So far as I can ascertain no case of this type has been recorded, but it is possible that severe spontaneous haemorrhage following tonsil abscess, as in the case of Somers,[21] and some of those mentioned by Newcomb,[22] were of this nature.

Innocent tumours of tonsils, by reason of increased vascularity, cause excessive bleeding (Sewell[23]), while malignant disease does the same to a still greater extent.

Haemophilia should be diagnosed only when the individual has had repeated attacks of bleeding, if not from birth, from infancy. Coagulation time may be delayed to forty or sixty minutes, in proportion to the severity of the case.[24] In a normal individual the loss of blood increases the coagulability to a certain degree.[25]

Purpura is often a symptom of toxic blood states which appear to impair coagulation. Temporary changes similar to those of haemophilia are stated to be brought about by such diseases as typhoid fever, diphtheria, and erysipelas (Chevalier Jackson[26]).

Primary anaemia (chlorosis) is not a cause of excessive bleeding, but secondary anaemias are.

Arterio-sclerosis, causing changes in the vessel walls, is often associated with increased blood pressure and secondary anaemia, due to the original disease, all of which predispose to excessive bleeding.

Aneurysm in tonsil area is rare, but cases have been recorded. Bleeding from such a source would probably be quickly fatal.

Exophthalmic Goitre.—Some writers (Sewell) give this condition as conducive to excessive bleeding. This is not my experience. I operated on two cases this year for tonsils in adults, which gave only an average loss of blood. In 1912 I operated on a female aged 25, anaemic, who had a large parenchymatous goitre. She bled excessively, but as there were other factors such as tonsil fibrosis, very large tonsils, and a sharp guillotine, it is difficult to say how much depended on the influence of the goitre.

Suprarenal and Pituitary Disease.—I have not been able to trace records of operations done in the presence of these conditions, but as both glands are intimately related to blood vessel control and coagulation I should anticipate a possible adverse influence.

Heart Disease.—This is included by Hill[27] and Moore[28] in the list of predisposing factors, but I am not convinced that it is the rule. I operated last year on three cases with combined mitral and aortic valvular lesions in adults, the bleeding being quite normal.

Contraindications to Operation.

These are already set forth and dealt with in detail on subsequent pages. No operation should be undertaken during active inflammation, suppuration, or ulceration, nor until at least two to three weeks after complete subsidence of either condition. Aneurysm is a permanent contra-indication. Abnormal tortuous arteries, if the tonsil is not involved in the loop, need not prevent operation, should the latter be important to the health of the patient, but the responsibility of the surgeon is greatly increased. Of haemophilia I have no personal experience. Osler[29] advises the avoidance of all sorts of operation, but some surgeons have successfully surmounted the difficulty by preliminary treatment to increase coagulability of the blood and by taking marked precautions to control any surgical bleeding during operation (Hill,[30] Graham[31]); other blood states contraindicate only temporarily. To menstruation and the menopause the same remark applies. Renal and cardiac diseases and alcoholism do not contra-indicate permanently, but may do so temporarily, though they point to the need for special operative precautions against undue bleeding.

Prophylactic Measures.

1. Calcium lactate. There is considerable diversity of opinion about the effect of this salt upon coagulation time, but many practical surgeons still use it. (Lee Cohen.[32])

2. Horse serum in doses of 10–25 c.cm. thrice daily by the mouth for from three to eight weeks reduces the coagulation time, in Hill's[33] case from five and a half minutes to two and a half minutes, and Graham's[34] from fifteen to under five minutes. Hurd[35] used horse serum and coagulose without effect in a case of excessive bleeding after tonsil dissection.

3. Human blood serum. Forbes[36] used this in treatment of active haemorrhage, Goldstein[37] as a prophylactic if coagulation time exceeds seven minutes. The blood is drawn into a test tube and allowed to clot, then serum is decanted. This is best from a relative of the patient —10–15 c.cm. is given intravenously or 20–40 c.cm. subcutaneously; the chief objection is the danger of transmitting syphilis, and hence need for a Wassermann test.

4. Haemoplastin is of equine and bovine origin. My colleague, Kisch, has given it an extended trial as a routine prophylactic measure in nose and throat operations, and is pleased with the results. He gives 1 c.cm. subcutaneously fifteen minutes before and also at end of operation.

5. Coagulose is a dried serum and is commonly used for local application; 0.65 gram dissolved in 8–10 c.cm. of sterile distilled water can be used subcutaneously and intramuscularly. It assists clot formation. Coagulin (Kocher-Fonia) can be used like coagulose.

6. Adrenaline and pituitrin are vasomotor constrictors, raising the blood pressure and therefore interfering with fixation of clot. They are inactive by the mouth (Miller[38]). Pituitrin reduces coagulation time by one-half (Kahn and Gordon[39]), and its action begins in fifteen minutes and lasts for twenty-four hours. It is given hypodermically in 12 minim doses to children and 15 to adults fifteen minutes before operation.

As Weil[40] has pointed out, serums have a prophylactic value in reducing coagulation time, their action beginning twenty-four to forty-eight hours after injection and lasting two to three months. Intravenously they act best, next intramuscularly, then subcutaneously. By mouth and rectum their action is not so certain. The ideal method of using such measures as these in a case where conditions predisposing to excessive haemorrhage are present is the following: Give two doses of horse serum or haemoplastin at intervals of forty-eight hours hypodermically, the last being two days before the operation, and just prior to the latter procedure—say half an hour—inject similarly 15 minims of pituitrin. The coagulation effect of both preparations and the vaso-constrictor action of the latter are thus obtained.

REFERENCES.

[1] O'Malley, J. F.: The haemorrhage of tonsil and adenoid operations, *Clin. Journ.*, January 28th, 1914. [2] O'Malley, J. F.: *Trans. Roy. Soc. Med.*, Section of Laryngology, January, 1913. [3] Lee Cohen: *Journ. Amer. Med. Assoc.*, vol. liii, No. 9, p. 698. [4] Damianos: *Wien. klin. Woch.*, February, 1902, p. 226. [5] Herman: Ibid. [6] Cocks, G. H.: *New York Med. Journ.*, 81, 1912. [7] Hill, Wm.: *Practitioner*, vol. 100, p. 301. [8] Moore, Irwin: Ibid. [9] Dunbar Roy: *Laryngoscope*, 12, 1902. [10] Cocks, G. H.: *New York Med. Journ.*, 81, 1912. [11] Skillern: *Journ. Amer. Med. Assoc.*, Chicago, 1913, lx, 172. [12] Brown Kelly: Cited by Burnett, Ingals, and Newcomb in *Diseases of the Ear, Nose, Throat*, 1901, p. 488. [13] Sachs: *Monatsschr. f. Ohrenheilk.*, 1907, xli, 277. [14] Hulke: *Lancet*, 1893, i, 1385. [15] Thompson: *Milwaukee Med. Journ.*, 1898, vi, 12. [16] Demme: *Wien. med. Woch.*, 1901, li, 48, 2245. [17] Somers: *Journ. Amer. Med. Assoc.*, 43, July–December, 1904. [18] Jenkins: Ibid., vol. 30. [19] Hammond and Lord: BRITISH MEDICAL JOURNAL, May 11th, 1901, p. 1143. [20] Newcomb: *Laryngoscope*, vol. xviii, 1908. [21] Somers: *Journ. Amer. Med. Assoc.*, 43, 1904. [22] Newcomb: *Laryngoscope*, vol. xviii, 1908. [23] Sewell, Lindley: *Medical Chronicle*, April–September, 1911. [24] Osler: *Principles and Practice of Medicine*, eighth edition, p. 756. [25] Rose and Carless: *Manual of Surgery*, "Haemorrhage," tenth edition, p. 319. [26] Chevalier Jackson: *Journ. Amer. Med. Assoc.*, vol. liii, No. 9, 1909, p. 698. [27] Hill, Wm.: *Practitioner*, vol. c, p 301. [28] Moore, Irwin; Ibid. [29] Osler: *Principles and Practice of Medicine*, "Haemophilia," p. 350. [30] Hill, Wm.: *Practitioner*, vol. c, p. 301. [31] Graham, Cecil: Ibid. [32] Lee Cohen: *Journ. Amer. Med. Assoc.*, vol. liii, No. 9, p. 698. [33] Hill, Wm.: *Practitioner*, vol. c, p. 301. [34] Graham, Cecil: Ibid. [35] Hurd: *Laryngoscope*, 1915, xxv, p. 855. [36] Forbes: *Ann. Otol., Rhin., and Laryngol.*, vol. xxv, March, 1916, p. 145. [37] Goldstein: *Trans. Amer. Laryngol., Rhin., and Otol. Soc.*, 1913, p. 256. [38] Miller: *Amer. Journ. Med. Sci.*, vol. clii, 1916. [39] Kahn and Gordon: *Ann. Otol., Rhin., and Laryngol.*, 1915, xxiv, p. 322. [40] Weil: *Bull. et Mém. de la Soc. Méd. de Paris*, 34, 1907, p. 43.

THE INFLUENCE OF OPERATIVE AND ANAESTHETIC TECHNIQUE UPON SERIOUS HAEMORRHAGE IN OPERATIONS ON THE TONSILS.

BY

HERBERT TILLEY, B.S., F.R.C.S.,

Surgeon, Ear and Throat Department, University College Hospital.

THERE are many surgical operations which are or have been practised for the removal of simple hypertrophy and diseased conditions of the tonsil, and as far as I know any one of them may be followed by serious post-operative haemorrhage. To discuss the technique of all these methods in their relation to such a complication would demand far more time than is at my disposal, and it would have little practical value, because the great majority of expert laryngologists in this country aim at the complete removal of the tonsil within its capsule. This being so we may divide operators into two classes—namely, those who enucleate with the guillotine and those who prefer the method of dissection. Therefore, the question we have to answer is: In what way does the technique employed in each method favour or hinder such haemorrhage?

Enucleation by the guillotine came into vogue about 1911 owing to its successful employment as a routine method by Whillis and Pybus of this city (Newcastle-on-Tyne). Sluder (U.S.A.) published a description of his technique in 1913. From 1911 to 1915–16 I employed the various types of guillotine which bulked so largely in the instrument makers' catalogues. Each new instrument was

extolled by its inventor as fool-proof, especially with regard to the question of haemorrhage, but experience did not confirm these assertions, and it was not long before I sold out my stock to less experienced friends at a 50 per cent. loss and found my old blunt-edged Morell Mackenzie guillotine better than any of the later models which had been foisted on me. From 1915–16 to the present time I have employed the dissection method only, and follow a technique slightly modified from that advocated by Waugh in the *Lancet* of 1908.

Two reasons led me to discard the guillotine: (1) Enucleation by dissection seemed to me to be a better surgical procedure, and it is suitable for all cases; (2) the bleeding at the time of operation is less and more easily controlled, while serious post-operative haemorrhage has almost entirely vanished from my practice since I discarded the guillotine. The question as to whether dissection is a better surgical procedure than enucleation with the guillotine is not within the limits of discussion, so we must turn to the second point—namely, which is the better method from the point of view of post-operative haemorrhage?

In an endeavour to answer this question my conclusions will be drawn from an experience of more than 1,000 cases of enucleation in private practice. From 1911 to 1915–16 I employed the guillotine in some 500 cases, but, unfortunately, I kept no records with regard to serious post-operative haemorrhage. From 1915–16 to the present moment I have careful notes of 670 consecutive patients on whom the dissection method was employed. This series includes patients of all ages from 2 to 67 years of age, and amongst these were two males who weighed 17 and 18½ stone respectively.

My reason for excluding hospital patients is because there is so much divided responsibility in the preparation, administration of anaesthesia, nursing, and after-care of the patients. What is everybody's business is nobody's business. Nevertheless, it is not without significance that, when last week I asked my chief assistant in the hospital, "Have we had any cases of post-operative bleeding lately?" he replied, "We have had none since I have been here; one never gets haemorrhage if the arteries are tied." This was his opinion after six months' work in the in-patient and out-patient departments of University College Hospital.

My experience derived from this large series of consecutive cases of enucleation by both methods—they number nearly 1,200—leaves me in no shadow of doubt as to the advantages of dissection over the guillotine from whatever aspect of the question it may be viewed, and particularly with regard to the question of post-operative haemorrhage. If rumour were true my contention would be strengthened. We cannot altogether disregard the statement of the sisters and nurses in the nursing homes; when one is told they dread Mr. A.'s or Mr. B.'s tonsil cases "because so many of them bleed afterwards," one almost invariably finds after questioning that the guillotine operation was employed.

Before a meeting of experts such as this it would be a waste of valuable time to describe in detail the technique of either operation, but from the point of view of the immediate bleeding, or of the chances of serious post-operative haemorrhage, there is one outstanding difference between the methods which cannot be gainsaid.

When the guillotine is used the blood vessels are divided more or less sharply in a transverse direction as they enter the capsule, while in dissection they are peeled off and left with torn or shredded ends. In the first instance bleeding is free and the cut vessel difficult to secure, especially if it be surrounded by fibrous tissue resulting from chronic inflammatory changes. On the contrary, when the vessel is peeled from its surroundings the elastic tissue in the artery wall tends to contract and retract the bleeding point, while at the same time it is far easier to secure it in pressure forceps. Need I remind you that when a man's arm is cut clean off—for instance, by a chaff cutter—he almost always dies immediately from haemorrhage, but if the arm is caught in the machinery and torn off he will frequently recover, because Nature employs her elastic tissue to contract and twist up the bleeding arteries.

In my opinion it is owing to this physiological fact that I am able to report that in 670 consecutive cases of enucleation by dissection I have only had to return to 4 of them (about 5/8 per cent.) in order to check serious post-operative haemorrhage. With the guillotine method and if my memory may be depended on, at least 4 to 5 per cent. demanded measures for checking such a complication.

In children up to the age of puberty this natural tendency of a peeled-off artery to contract may be assisted by pressure continued for two minutes. For this purpose a firm plug of dry sterilized wool should be held in the points of a pair of long dissecting forceps and pressed into the empty tonsillar recess. To make assurance doubly sure, the tonsillar branch of the descending palatine artery may be ligatured, and I do this in a large majority of my patients, and without exception in those who, living at a distance, would not be within easy reach in case of necessity.

It is not difficult to see the vessel nor to recognize its position and apply artery forceps when the upper pole of the tonsil has been freed from its recess. After the remainder of the tonsil and its lingual extension has been dissected out, a ligature of sterilized thread or silk should be applied to the artery. A pad of sterilized wool is now placed in the tonsillar fossa, and the second tonsil is dealt with in a similar manner to the first.

May I offer you a technical "tip" with regard to the removal of the main portion of the tonsil? When the upper pole has been freed from its connexions the remainder of the gland will be most easily peeled from its bed by gently forcing downwards a small piece of dry sterilized gauze between the capsule and the surrounding tissues. The lower fibrous attachment or the lingual extension of the tonsil, as the case may be, should then be clamped with forceps and cut through on its medial aspect. Under no circumstances should the patient be allowed to leave the table until the tonsillar recesses are dry, and even the slow filling of these with blood I regard as an indication that further attention is necessary.

At this point I will make a dogmatic statement: "If the tonsillar branch of the posterior palatine artery be ligatured or securely crushed by forceps, and the patient leaves the table with the tonsillar recesses dry, there will be no serious post-operative haemorrhage." It will occasionally happen that in adults with fibrous and adherent tonsils it may be necessary to ligature one or even two additional vessels, especially in the lower and external wall of the recess near the base of the tongue.

I do not share the view that it is difficult to tie these vessels without special instruments, because if the artery forceps be gently tilted forwards and towards the middle line, the loop of ligature can be carried down in a long pair of dissecting forceps and passed round the bleeding point. A well known anaesthetist has probably shown many of my London colleagues the method which I employ for this purpose. It has proved so satisfactory in my hands that I have never yet had occasion to sew the faucial pillars together, nor do I possess any of the numerous instruments which have been invented for preventing post-operative tonsillar hæmorrhage. Incidentally, I have never used any of the prophylactic measures mentioned in Mr. O'Malley's paper.

To tie the bleeding point is an elementary principle in surgery, whereas to sew it up in the surrounding tissues seems to me to be in the nature of a surgical offence. Nor do I sympathize with those who pass a needle deeply to the bleeding point and ligature it with a quantity of the investing muscular tissue, because if sloughing occurs we may produce the very complication we seek to prevent.

It is not a fact that the time taken in enucleation by dissection is longer than that required for the guillotine, provided we are agreed that the patient does not leave the table before all bleeding has ceased. Certainly the actual removal of the tonsil is quicker with the guillotine, but my contention is that the bleeding will take longer to control, so that what we make on the swing we lose on the roundabout. On the morning of July 6th I enucleated the tonsils and removed the adenoids of two children. Dr. Rood and I entered the nursing home at 8.45 and left it at 9.25. Could the guillotine operator be more expeditious?

Position of the Patient.

In the thousand or more cases which form the basis of this communication every one of them has been operated on with a sandbag under the shoulders so that the head can be fully extended. In this position no blood can enter the stomach nor the lower air passages.

It is very important to train nurses as to the position in which the patient should be placed when returned to bed.

It should be the position of rest, lying on one side with the head slightly extended, the uppermost leg well flexed at the hip and knee, and the arm tucked into the chest in such a way that the uppermost shoulder is propped up and the chest given free play for normal respiratory movements. No pillow should be provided until the patient has fully recovered the pharyngeal and laryngeal reflexes. By such means we provide a free airway and free respiratory movements, conditions the value of which cannot be over-estimated in their tendency to prevent congestion which favours post-operative haemorrhage.

Some months ago I was suddenly called into the ward to see a patient who had been returned from the theatre some five minutes previously. She was nearly asphyxiated, and simply because the nurse in charge had allowed the patient's head to become so strongly flexed that breathing was impossible.

Anaesthesia.

I have ceased to use local anaesthesia for enucleation of the tonsils. It is possible to abolish pain and to produce an artificial anaemia by the addition of adrenaline to the novocain or eucaine. But retching is not always abolished and it hampers good work, while there is always a possibility of post-operative bleeding when the influence of the adrenaline wears off. In nearly all my cases ether is given by the open method until the throat reflexes are abolished, and chloroform is then administered through a Junker's apparatus during the actual manipulations of the operation. If the ether is preceded by a hypodermic injection of atropine (1/100 gr.) given forty-five minutes before the operation there will be no profuse secretion of mucus, and the patient preserves a healthy pink colour.

Ether is a stimulant and increases the general bleeding, but this occurs at the time of the operation when the surgeon is at hand and is prepared to stop it; as the patient recovers from the anaesthetic the tendency to haemorrhage from over-stimulation diminishes. On the other hand, chloroform is a depressant, and while there is less bleeding during the operation (as compared with ether) this tends to increase as the anaesthetic wears off and the blood pressure rises. If bleeding now occurs the surgeon may not be within reach. Furthermore, we never know when the chloroform is going to claim an unexpected victim.

SURGICAL REMOVAL OF THE TONSILS:

LOCAL METHODS OF ARRESTING SERIOUS HAEMORRHAGE FROM THE TONSILLAR BED.

BY

IRWIN MOORE, M.B., C.M.Edin.,

Surgeon, Throat Hospital, Golden Square.

IN response to the invitation to contribute a paper at this meeting on local methods of controlling haemorrhage during removal of the tonsils, I will endeavour to place before you not only my own personal experience but also that of other operators as recorded in the extensive literature on the subject.

Excessive haemorrhage after removal of the tonsils, though apparently more frequent during recent years—since the necessity for complete enucleation in a considerable number of cases has been recognized—is rare in proportion to the large number of tonsils removed. Though exceptional, it is met with sufficiently often to merit serious attention. One writer remarks that "the removal of tonsils thoroughly performed is usually unattended by untoward results, still it is not entirely free from alarming, sometimes dangerous, haemorrhage, and although this appears to be the exception it should not be ignored, and the surgeon must always be prepared both mentally and manually to cope with a haemorrhage that may unexpectedly occur." The following classification of haemorrhage is that suggested by William Hill:

Primary, the most common form, occurring during operation and continuing after excision is effected.

Early secondary or reactionary, or, as unhappily called by some, delayed haemorrhage, occurring within a few hours of cessation of the primary operative bleeding, usually five or six hours after operation. This is the type we frequently have to deal with in guillotine operations, in which the initial bleeding has apparently ceased at the time of operation, but has really continued and been overlooked.

Recurrent secondary haemorrhage; several attacks during the first few days—uncommon.

Late or true secondary haemorrhage—several attacks occurring from the fourth to the seventh day—is due to separation of sloughs, and is very rare. I have only seen one such case, in the hands of a colleague.

It has been shown that swabbing the tonsillar bed with astringents and haemostatics such as liquor ferri perchloridi, styptic colloid, turpentine, hamamelis, "hazeline," adrenaline, paste of gallic and tannic acid, etc., whilst applicable to mild cases, cannot be depended upon in cases of excessive bleeding, the few cases reported in which they have been serviceable being undoubtedly due to the accompanying pressure, and valuable time should not be lost trying these remedies. Adrenaline increases the tendency to post-operative reactionary or secondary haemorrhage by preventing a strong clot forming in the terminal capillaries.

Though haemorrhage may at times be exceedingly troublesome, there is no reason why it should cause anxiety, or reach the stage that is exhausting to the patient, or dangerous to life, if we keep in mind that it can easily be controlled by proper surgical measures. Haemorrhage from the tonsillar bed should be treated like haemorrhage in any other part of the body. It does not matter whether the bleeding is arterial from a spurting vessel, venous bleeding, or capillary oozing from a large surface, if spontaneous stoppage does not occur, then, as in haemorrhage elsewhere, the really efficient and only certain method of checking it is compression or ligature.

INCOMPLETE TONSILLECTOMY—SO-CALLED TONSILLOTOMY—AND COMPLETE TONSILLECTOMY CARRIED OUT WITH THE GUILLOTINE UNDER SHORT ANAESTHESIA.

This operation is generally carried out with the patient lying in the recumbent posture with the head partially extended on the neck. Some operators prefer the head in the lateral position.

The Treatment of Haemorrhage at the Time of Operation.

Haemorrhage may be brisk at first for a few seconds, but it generally ceases spontaneously in from three to five minutes, especially in children. Any free bleeding should be controlled by sponge or swab pressure, and the patient's head, if lying on the back, should be turned over to the side so that any blood in the pharynx may run out of the corner of the mouth.

The free use of ice or iced water at this time is very efficacious in controlling moderate bleeding following enucleation under short anaesthesia, and ensuring spontaneous stoppage by quickly exciting vasomotor contraction of the muscular coat of the vessels, but it is of very little use, if any, in excessive late haemorrhage.

The Treatment of Haemorrhage occurring after Operation.

As previously stated, a reactionary haemorrhage may be a continuation of a primary haemorrhage. If it occurs after the primary bleeding at the operation has ceased, it generally comes on between three and six hours, though severe cases of secondary haemorrhage, due to separation of sloughs, have been reported in which even twelve days have elapsed, but these are rare. In case the bleeding does not stop at the time of operation, or, having stopped, recurs later, the pharynx should be thoroughly inspected by means of an efficient head-light, and the tonsillar region cleared of blood by sponging, and steps taken for its control either by continuous sponge pressure, the ligaturing of vessels or bleeding areas, or the temporary suturing of the faucial pillars.

The most serious type of reactionary bleeding, which may lead to extreme exhaustion or death, is a slow persistent oozing from the entire surface of the wound, the blood being swallowed by the patient. In these cases very little blood may be seen on inspection of the throat, but the patient has recurring attacks of vomiting of large quantities of blood from the stomach. With this type of case a large clot is apt to form in the bed left by removal of the tonsil, which keeps the vessels from undergoing retraction. A portion of the clot may hang down the side of the pharynx like a wick, and not only keep up the bleeding, but also cause irritation, coughing, and expectoration, which increases the haemorrhage. It is important when such a clot forms to remove it, for it generally accompanies and covers extensive capillary oozing. I have

seen, in consultation with my colleagues, a number of cases in which the bleeding promptly stopped after removal of the clot. This clotting must not be confused with the normal clotting of blood in the severed vessels. With reactionary haemorrhage a much larger total loss may occur, and these are the most serious cases. The loss of a pint of blood may cause much more pronounced effects in one individual than in another of the same age, sex, and general condition. Infants and young children bear any loss badly, and a relatively small loss may be fatal. As we should expect, the deaths from haemorrhage following these operations are most common in the young.

If the bleeding is general and cannot be specially localized, the firm pressure of a sponge under the thumb in the tonsillar bed, with the corresponding finger below the angle of the jaw, or on the vessels of the neck, and kept in position for ten or fifteen minutes, generally suffices to stop the bleeding. A haemostat is recommended by some operators, so as to exert pressure on the tonsillar wound, the most convenient for this purpose being the one designed by Watson-Williams. The chief objection, however, to a clamp is that it causes great discomfort and distress to the patient and gives rise to constant coughing and straining, which may start bleeding from the opposite tonsillar bed. The haemostat has been described as an old-fashioned and non-surgical method of controlling haemorrhage. Harmon Smith reports one case in which the haemostat was kept in position for sixteen hours with no recurrence of bleeding, and another in which bleeding recurred after the haemostat had been in position for twenty-one hours, necessitating its replacement, when it was left on for forty-seven hours, resulting in sloughing in the throat and necrosis of the tissues. He says considerable oedema of the cervical region may result.

If haemorrhage occurs from a spurting vessel, and if the bleeding point can be seen, it should be seized with long-handled artery forceps and the vessel ligatured. When the bleeding points are concealed under the faucial pillars they are best found by retracting the anterior pillar with forceps or hook. One of the chief sources of haemorrhage is the tonsillar branch of the descending palatine in the dome-shaped upper part of the tonsillar bed. It is best found by drawing up the supratonsillar margin of the palate.

THE DISSECTION METHOD OF COMPLETE TONSILLECTOMY UNDER PROLONGED ANAESTHESIA.

The question of greater liability to haemorrhage by this method compared with partial removal need not be considered in view of the fact, which is readily admitted, that in removal by dissection, if properly carried out, bleeding can be more easily or completely controlled.

A similar posture to that employed in a low tracheotomy or thyro-fissure is recommended. It is the posture employed by many of my colleagues. (Fig. 1.)

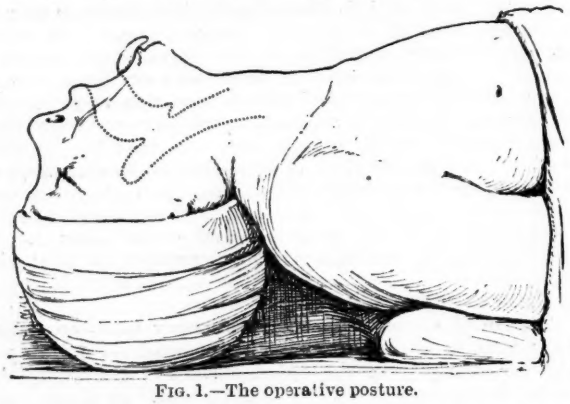


FIG. 1.—The operative posture.

The patient is placed in the recumbent position with the shoulders raised on a sandbag and the head lowered and well extended on the neck. This brings the chin, middle line of the neck, and sternum almost in a direct line. The trachea slants downwards towards the post-nasal space, and the hard palate becomes almost horizontal with the table; the tongue is drawn forward from the mouth by a tongue clip. The operator sits or stands at the head of the table. Any blood from the tonsillar region passes into the post-nasal space or pools in the concavity of the hard palate, and can easily be seen and removed with swabs. A free respiratory passage is assured, and the inspiration of blood made impossible.

Some operators prefer the lateral position, and stand on the right hand side of the patient. In this position blood flows into the dependent cheek and out of the mouth. This posture, however, in my opinion, is not as convenient or safe as the former position.

Treatment of Haemorrhage at the Time of Operation.

In a few cases bleeding may retard or temporarily embarrass the operator; when it occurs during the dissection it is generally of an oozing character and may be controlled or checked by means of a cotton-wool or gauze swab placed between the partially separated tonsil and the tonsillar bed. It may be necessary to apply a fresh dry swab from time to time during the dissection. If a spurting or bleeding vessel is encountered during the dissection, pressure forceps should be applied at once and the vessel ligatured.

Treatment of Haemorrhage Immediately Following the Operation.

After removal of the first tonsil, if there is still bleeding, the tonsillar bed should be packed with a gauze swab and firm pressure applied with the finger. If, a few minutes later on removal of the swab, there is only a slight oozing, a fresh, dry swab is again placed in the tonsillar bed and removal of the second tonsil commenced.

After removal of the second tonsil, swab pressure is again applied to both tonsillar beds until they are quite dry. If, however, much bleeding continues and no special bleeding point can be observed, the bleeding area or areas should be at once seized with pressure forceps and ligatures applied.

It is one of the golden rules of the present day method of removal of the tonsils that the patient is not removed from the table until all bleeding points or oozing have been stopped and the throat is practically dry.

The Ligaturing of Bleeding Vessels or Areas.

To enable this to be carried out easily, the anaesthetic must be continued or the patient again anaesthetized. A full and direct view is obtained by the posture previously described and the employment of a tongue spatula to the base of the tongue further assists in exposing the lower poles of the tonsillar beds.

Any spurting or bleeding vessels can be picked up and securely ligatured. When no bleeding vessel can be seen but only a small bleeding muscular area, this can likewise be seized by forceps and ligatured. The ligaturing of bleeding areas may be readily achieved and the slipping of ligatures prevented by passing a needle (by a method described later) with a ligature through the musculature of the tonsillar bed, thus surrounding the bleeding area (Fig. 2). A careful search, however, generally reveals a bleeding point.

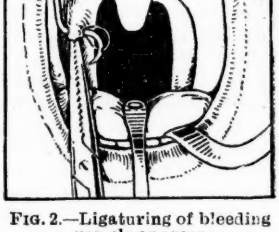


FIG. 2.—Ligaturing of bleeding vessels or areas.

In the event of failure of ligature to stop the bleeding or in cases in which oozing is of a general character and difficult to locate, it may be advisable to temporarily suture the faucial pillars. This procedure, if properly carried out, is a sure preventive of secondary haemorrhage, especially in adults of plethoric disposition.

Temporary Suturing of the Faucial Pillars.

This procedure, which is simply a form of prolonged compression, has generally been looked upon and described as an operation of considerable difficulty. It is, however, much more simple than is generally supposed, provided the proper instruments are used and the patient is placed in the recumbent-extended-head posture already described, the operator sitting or standing at the head of the patient. Or the recumbent posture may be employed with the head half turned to the right side whilst the operator stands

on the right side of the patient. A general anaesthetic is absolutely necessary with children, though occasionally in a courageous adult local anaesthesia may prove sufficient.

The instrument I recommend is really a half-circular needle with the eye close to the point, and set at a definite angle to a slender shaft 3¼ in. long attached to a flat handle 4 in. in length. This makes a very useful instrument 7¼ in. in length. The important points are the angle at which the needle is attached to the shaft and its attachment to the long flat handle, which enables it to be used without getting in the way of the lower jaw or the mouth-gag, while the gag need not be changed from the position in which it was originally placed on either side.

When the patient is in the recumbent-extended-head position, the needle, threaded with a catgut ligature 18 in. in length, should be passed by orientating the needle from before backwards, in the case of the right side, first through the anterior faucial pillar, and then through the posterior, about ¼ in. from their edges, whilst in the case of the left side the needle should be passed from behind forwards, first through the posterior and then through the anterior pillar (Fig. 3). If the patient is lying in the recumbent-lateral-head position the needle is passed in the opposite direction.

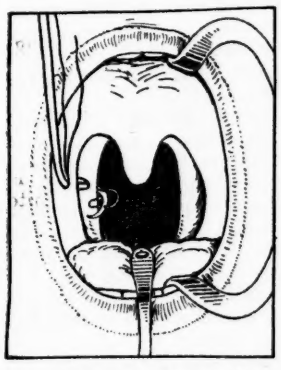


FIG. 3.—Temporary suturing of the faucial pillars.

After the needle has been passed through both pillars, the ligature is caught by the hook at the eye of the needle and drawn through and out of the mouth, while the needle is withdrawn in the opposite direction over the remainder of the ligature. The two ends of the ligature are then in the position for tying, and may be secured before tying by artery forceps, while a second or third ligature is passed in a similar way. The tonsillar bed may be then packed with a strip of 1 inch gauze by means of nasal dressing forceps, whilst each ligature is drawn together and tied by introducing the fingers deeply within the mouth. In most cases it is quite sufficient to draw the pillars together without packing the tonsillar fossa. The ligatures may be left undisturbed until they have been loosened by sloughing—if no gauze has been inserted in the fossa—but it is better that they should be removed in twelve hours to avoid the risk of retained sepsis, especially in those cases in which a gauze packing has been inserted in the tonsillar bed. The ligatures may be easily cut by means of a small pair of angular scissors, with immediate release of the faucial pillar.

Temporary suturing of the faucial pillar causes very little discomfort; adult patients complain of less pain than when the pillars are gaping and the tonsillar beds are exposed, and there is no more liability to adhesion between or contraction of the pillars if the ligatures are released the morning following the operation; contractions or the formation of fibrous adhesions may be prevented by the early exercise of the palato-glossal muscles. In those cases of incomplete tonsillectomy in which a portion of the tonsil has been left behind and bleeding occurs the ligatures should be passed not only through the faucial pillars, but also deeply through the tonsil stump.

The Treatment of Reactionary or Secondary Haemorrhage.

The continuation of a primary haemorrhage or the occurrence of a true secondary or reactionary haemorrhage is avoided or rendered unlikely by the ligaturing of vessels, or the suturing of the faucial pillars. If it does occur it is probably due to slipping of a ligature or to improper or careless suturing of the pillars, and indicates the necessity of again anaesthetizing the patient and searching for and ligaturing the bleeding point, or resuturing the pillars.

The risk of subsequent haemorrhage can be minimized by keeping in mind the predisposing and exciting causes, and by attention to the following precautions:

1. Those cases in which surgical procedures are contraindicated should be excluded or postponed. (See Irwin Moore: "The treatment of enlarged or diseased tonsils in cases where surgical procedures are contraindicated," *Journ. Laryngol. and Rhinol.*, October, 1919.) The only two cases of serious haemorrhage which I have had in my own personal experience belonged to this class, and were undoubtedly due to my own precautionary neglect.

2. Refusal to operate on any patient unless in hospital or nursing home should be insisted upon.

3. Careful attention must be given to the preparation of the patient for operation. The operation of tonsillectomy is still looked upon by many practitioners in too light a manner; consequently small consideration in some cases is paid to ordinary surgical procedures. In all cases there should be a period of preparation, and this is equally as important as for a more serious operation. It should not be forgotten that the general health of these patients is indifferent or bad, and that many are suffering from septic tonsils with toxic absorption and have poor resisting power.

The administration of a purgative two days prior to the operation, the prohibition of smoking and alcohol for at least three or four days, plain and light food for twenty-four hours, with nothing for four hours before operation, is indicated. Rest for twelve hours before operation conduces to a placid nervous system and consequently better vasomotor control.

The use of prophylactic measures, such as calcium lactate or horse serum, in those cases in which even moderate loss of blood is very undesirable, as in anaemias.

4. The co-operation of an expert anaesthetist is necessary. In no operation are the services of an expert anaesthetist of greater value, and the success of the operation and the question of haemorrhage may be in no small way dependent on his skill. A clear respiratory passage should be assured and an adequate intake of air maintained throughout the anaesthesia so as to avoid unnecessary congestion and increased blood pressure. In this connexion it is important that the tongue should not be allowed to fall backwards and obstruct the air passage. The passage of blood into the larynx or stomach during the operation, interfering with normal respiration and causing coughing and retching, should be prevented by posture and sponging.

The employment of open ether—or more correctly designated by William Hill the enclosed ether–open ether sequence—is the method of choice, preceded by an injection of atropine in all cases of enucleation by dissection, since it produces a deep, prolonged, but safe and non-congestive anaesthesia. It does not produce any more congestion or subsequent bleeding than chloroform. Apart from its effect in reducing mucous secretion, Waugh has confirmed from collected reports that atropine acts as a haemostatic. The deep and dangerous chloroform anaesthesia considered necessary by some operators for the dissection method of enucleation in order to reduce the bleeding during operation and obtain a bloodless field, increases the risk of reactionary or secondary haemorrhage, and is now, I trust, a thing of the past.

5. Selection of surgical procedures in which easy control of bleeding may be definitely secured at the time of operation, before the patient leaves the operating table. A dry tonsillar bed is what we must specially aim for. This is secured by the following means:

(*a*) Posture of the patient—a position which fully exposes the pharynx and facilitates the securing and ligaturing of vessels is necessary. This is best attained by the tracheotomic or thyro-fissure position already described.

(*b*) Skilful operative technique must be employed so as to avoid damage to the faucial pillars and musculature of the tonsillar bed. The various opinions expressed by different operators as to the frequency or otherwise of post-operative haemorrhage appear to support the view that the amount of bleeding depends to no small extent on the technique of the operation and the skill of the operator. Removal, if improperly or incompletely performed, may result in damage to the muscular fibres of the faucial pillars or the superior constrictor of the pharynx with resulting bleeding from the contained vessels. Post-operative haemorrhage is frequently caused in this way.

(*c*) Encircling the surgical pedicle after completion of dissection. Blunt guillotines, dissectors, or snares must be employed for encircling, etc.

(*d*) All bleeding vessels or areas must be ligatured, and in addition in all adult cases the temporary suturing of the faucial pillars, as a preventive of secondary haemorrhage, is necessary.

6. There must be adequate post-operative supervision and care. Many haemorrhages occur owing to lack of attention to post-operative care. It is advisable therefore to keep constant observation for some time after operation. The patient should be placed in bed in the lateral position

FIG. 4.—The post-operative posture.

(Fig. 4), so that if oozing does occur the blood trickles into the cheek and out of the mouth, where it may be seen by the nurse, instead of into the stomach. Whilst the patient is recovering from the anaesthetic a cork or bobbin placed between the teeth is useful in keeping the mouth open and preventing swallowing. Expectoration should be prevented, for, according to one writer, it may cause the sucking of the clot from the end of a severed vessel, and so encourage persistent bleeding. If the patient is restless after recovering from the anaesthetic, sleep should be encouraged by an injection of morphine in doses of 1/12 to 1/8 in children and 1/6 to 1/4 in adults. This prevents vomiting and reduces the blood pressure.

If a child is allowed to lie on its back the blood may trickle into the stomach, and this may not be detected until the sudden vomiting of a large quantity of blood occurs, and the patient is found to be in a collapsed condition. If the patient looks pale, is restless, with irregular shallow sighing breathing and a rapid pulse, it is highly probable that bleeding is taking place. The nurse should therefore be instructed that her chief duty is to watch the movements of the larynx to see that the patient is not swallowing an appreciable quantity of blood.

Mr. Mark Hovell has recently reminded us of the fact that all enlargements of the tonsils do not necessarily require enucleation. Mr. Hovell also referred to the number of modern instruments designed for dealing with bleeding during tonsillectomy as an indication of the risks of the operation. These additions to, or improvements in, our instrumentarium indicate, in my opinion, that we, as specialists, are now thoroughly conversant with and prepared for such risks. Recent experience has shown that as a result of more careful and perfect operative technique we have reduced those risks to a negligible quantity. We are now not only able to prevent or control any bleeding which may occur during or after operations or treatments in either childhood or adult life, but also to remove into safety any septic tonsil or tonsillar stump left over from a previous incomplete operation. The stigma which has so long been attached to this operation owing to bad or imperfect technique should now be a thing of the past. I reciprocate most heartily the hope expressed by a recent writer that: "From now onwards there will be less indiscriminate operating and more skilful work done." This should constitute the keynote of our work.

PRACTICAL CONSIDERATIONS ON THE TREATMENT OF HAEMORRHAGE DURING AND AFTER OPERATIONS ON THE TONSILS.

BY

DAN MCKENZIE, F.R.C.S.Edin., M.D.Glasg.,

Surgeon, Central London Ear and Throat Hospital; Oto-Laryngologist to the French Hospital, London.

HAEMORRHAGE which, if unchecked, will prove fatal, may result from tonsillectomy by any of the methods in vogue at the present time, and apart from fatality, a loss of blood sufficient to blanch the patient and to lead to a prolonged and tedious convalescence is surely to be regretted, particularly since we know that it can be avoided. In this, therefore, as in other surgical operations, it is the plain duty of the surgeon so to contrive as to reduce the loss of blood to the least possible quantity, and this can be done in the usual manner at the time of operation by seizing and ligaturing all bleeding points in the tonsil bed.

The bleeding should be controlled and the surgeon should see that the wounds in the throat are quite dry before the patient leaves the operating table. In other words, if a patient has a severe haemorrhage after tonsillectomy the surgeon is to blame. But while, as I have said, severe haemorrhage may attend any of the modern methods of removing the tonsil, there can be no doubt of this: that some methods lead to more haemorrhage, and are more liable to be followed by severe haemorrhage, than others. Enucleation of the tonsils in children, for example, by means of the guillotine, if a bluntish instrument be used, is seldom followed by serious bleeding, the amount lost averaging no more than six or eight ounces. Nevertheless, serious haemorrhage does sometimes surprise us in children even when a blunt guillotine is used.

In patients over 15 years of age, on the other hand, enucleation with the guillotine under a short anaesthesia has so often led to serious haemorrhage in my own private and hospital practice that I have abandoned the method. In adults the least amount of bleeding occurs when the tonsil is removed by blunt dissection under local anaesthesia, the snare being used to sever the final attachment at the lower pole of the gland. So much difference is there in the quantity of blood lost, and in the risk of serious haemorrhage, between local anaesthesia and general anaesthesia in this operation in adults, that the former may be classified as a minor operation in surgery, while the latter is decidedly major.

There are, however, many adult patients who will decline operation under local anaesthesia, and as local anaesthesia is unsuitable for children, the surgeon must be ready to operate by either method, and prepared to control whatever bleeding his operation produces. It may be, and it often is, difficult to bring haemorrhage during or after operation to a standstill, but I have not yet ever found it to be impossible. If we are operating with the guillotine the operation is so rapidly accomplished that any attempt at controlling the haemorrhage during the separation of the tonsils is, of course, out of the question. But during a blunt dissection, and especially during the relatively slow process of snaring, bleeding may be minimized by the simple act of holding the loosened tonsil in its bed until the severance is completed. After the removal of one tonsil the bleeding should be arrested before the second tonsil is attacked. (Obviously this rule is not applicable to rapid guillotine enucleation in children.)

It seems sometimes to be assumed that the usual variety of bleeding in the tonsil bed is from an artery. But this depends upon the anaesthetic and upon the position of the patient. All who have operated on adult patients under general anaesthesia, and in the recumbent position, will agree that the free haemorrhage characteristic of such operations is largely venous, just as it is in external dissections of cervical regions; they will also agree that it is often difficult to control by simple sponge pressure. In addition to that I have been forced on several occasions to ligature an area for the arrest of capillary haemorrhage, both during and after operation.

To detect in a large wound in a red mucous cavity the point or points from which blood is freely welling or spouting; to catch up these points deliberately one by one with pressure forceps until all have been brought under control; and finally to apply with slippery gloved fingers a ligature round each point, tying the ligatures with

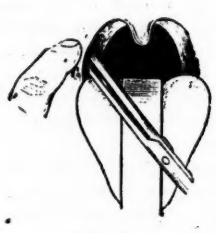


FIG. 1.—Catching a bleeding point on the posterior aspect of the anterior pillar of the fauces.

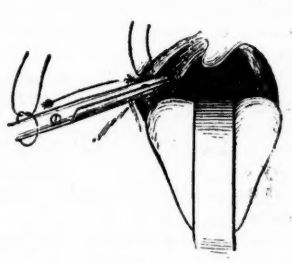


FIG. 2.—Application of ligature to the bleeding point.

forceps in the depths of the pharynx, constitutes a series of steps both tedious and difficult to accomplish. The task, however, can be facilitated and abbreviated by practice, and in order to acquire skill and speed it is a good plan to make a rule of tying all, not only the major but also the minor points of bleeding.

The usual sites of such bleeding points are, in order of frequency, the posterior aspect of the anterior pillar of the fauces; the bed of the tonsil about its middle; the lower end of the wound on or near the tongue; and, most inaccessible spot of all, the upper pole of the wound under the hood of the soft palate. Spouting vessels are, generally speaking, easily seen and caught, although a cut artery in the anterior pillar, playing like a hose upon the bed of the tonsil, is apt to be mistaken for a vessel in that bed. But so frequently is a vessel in the pillar to blame that one may make it a rule, in any free haemorrhage, to catch this part up with the forceps before attending to any other possible source of bleeding. The pillar may be gently picked up with a long pair of dissecting forceps and turned round so as to expose its raw posterior surface and the bleeding point upon it. But this is not always necessary, for if we use a long, straight pair of pressure forceps and nip the raw posterior surface of the pillar, not with the point, but with the side of the forceps, pressing in the pillar between its jaws from in front with the forefinger of the disengaged hand, no exposure is required. The vessel is caught, and the amount of bleeding is at once materially reduced. It will be observed that the point of the forceps is free. The ligature is now passed round the shaft of the forceps, given one turn of the knot, and slid down by means of a pair of dissecting forceps over the free end of the pressure forceps, tightened, and finally tied. As ligature material I find silk much more easy to manipulate than catgut.

FIG. 3.—The forceps with their point free.

On the tonsil bed, if a bleeding point is seen, it may be seized like the artery on the anterior pillar with straight pressure forceps. But in this situation the point of the forceps almost invariably becomes engaged, and it is difficult—sometimes, indeed, it is impossible—to get a ligature tied beyond the point without pulling the forceps out so much as to tear them off the loose friable tissue. For that reason I frequently make use of an old-fashioned pair of tongue forceps for seizing the vessel, since it is easier to pass the ligature over their obtuse oval end. These forceps may also be used for bleeding points or areas near the tongue.

I cannot support the practice of suturing the faucial pillars for haemorrhage because I have seen the bleeding continue in spite of the suturing. I have not yet found it necessary to ligature either carotid, nor should that measure ever be blindly adopted. Arterial bleeding it will check; venous bleeding it will have no effect upon. In any case, ligature of the carotid is unnecessary if the bleeding points in the tonsil wound can be seized.

Post-operative Haemorrhage.

Without for a moment denying the occurrence of reactionary haemorrhage, I must say that when I have had a case of post-operative haemorrhage I have never felt able to throw off the self-reproach that the bleeding was not reactionary but only prolonged, and that it had arisen from my own oversight. This view of the question is, moreover, supported by the fact that the post-operative loss of even a few drachms of blood is now quite rare in my practice. Nevertheless, in spite of every care, post-operative—or, if you like, reactionary—haemorrhage will occasionally occur, so that we must be prepared to cope with it.

Post-operative haemorrhage from the tonsil wound is very often concealed haemorrhage, unless measures are adopted to prevent that concealment, and the first indication that the wound is bleeding consists in the vomiting by the patient of a large quantity of blood, little or not at all darkened by the gastric juices. This event should always be reported, and it should lead to an immediate inspection of the wound. If ignored, the vomiting will recur two or three times, and then the patient becomes faint and we have to deal with the effects of a severe haemorrhage. The fainting, as a matter of fact, often leads to a cessation of the flow; but all the same, this stage should never be reached. It is worth noting that if the patient is returned to bed with a dry throat he is seldom sick after the anaesthetic, and if he is the blood ejected is scanty and very dark. In order to prevent concealment of haemorrhage the patient, when he is returned to bed, should be laid on one side with the face semi-prone, in order that blood from the pharynx may gravitate into the mouth. This hint I owe to our President, Dr. William Hill, and I have found it of great value.

When haemorrhage is found to be in progress after operation immediate steps should be taken to check it. At the same time if the patient has become blanched and faint the general treatment for acute anaemia should be instituted. Under illumination by headlight or mirror the throat is examined. If one tonsil wound contains a clot, that is the culprit. If both contain clots then both are bleeding. The clot is removed by sponging, and search is made for the bleeding point or area. During these manipulations our work is facilitated by a Doyen's gag in the patient's mouth. Curiously enough the gag has a soothing and supporting influence upon a nervous patient.

If the bleeding point or points can be seen they should be picked up with pressure forceps as described above and ligatured. It suffices, no doubt, to leave the forceps on without any ligature for a couple of hours, but, for some reason I cannot understand, pressure by forceps is painful while the pressure of a ligature is painless, or, at all events, no complaint is made.

Should the bleeding point escape detection in spite of a close search, or, as frequently happens, should we fail to secure it with forceps or ligature, there is no need to prolong the attempt. Watson-Williams's clamp may be at once applied. In doing so it is important to see that the inner blade of the clamp, which should be well padded, is accurately apposed to the area containing the bleeding point, and that it is well sunk in the tonsil bed, as thereby retching and pharyngeal spasm are avoided. Children get quickly accustomed to the presence of the clamp, but in adults a small dose of morphine hypodermically hastens their reconciliation with the intruder.

The clamp may be removed in two or three hours, and it seldom requires to be reapplied, but it may be left on for as long as twelve hours if care be taken to relax it for a little from time to time and to shift the outer blade to fresh areas on the cheek. Otherwise the pressure may cause some reactionary pain and swelling. I should like to take this opportunity for expressing my gratitude to Dr. Watson-Williams for a very useful aid in time of trouble.

With regard to internal haemostatics I have never been able to satisfy myself as to the reliability of the calcium salts, but recently I have been trying haemoplastin and am inclined to regard it as helpful. It is, however, expensive.

My chief object in speaking to-day has been to urge the view that the removal of tonsils is a cervical dissection from within, and that the old rule in such dissections of arresting all haemorrhage at the operation, with forceps and ligatures if necessary, should invariably be followed.

LIGATURE OF THE EXTERNAL OR COMMON CAROTID VESSELS IN SERIOUS TONSILLAR HAEMORRHAGE.

BY

T. H. JUST, F.R.C.S.,

Assistant Surgeon, the Throat Hospital, Golden Square; Chief Assistant, Throat Department, St. Bartholomew's Hospital.

THE question as to whether it is ever necessary to resort to ligature of the external or common carotid vessels in the neck, and whether such ligature is to be relied on, is one which is made more debatable by the exceeding rarity of the occasions arising for the employment of this manœuvre in cases of operations on the tonsils for hypertrophy or infection.

The occasions on which the necessity for ligature of the carotid artery may arise are:

1. Very severe haemorrhage arising in the fossa at the time of operation, which cannot be controlled by the means usually employed.

This form of haemorrhage is due to an abnormal position of the internal or external carotid artery or facial artery, so that a loop of the main artery runs into the tonsillar fossa and is severed during the operation.

2. Severe haemorrhage occurring during the first or second day after operation.

3. True secondary haemorrhage occurring during the sixth to the fourteenth day after the operation, which continues in spite of the more conservative methods of treatment.

Butlin, who classifies the bleeding after operation on the tonsils in this way, sums up the methods of treatment so admirably that I will, without apology, quote his opinion:

First. Should violent arterial haemorrhage immediately follow operation it may result in instant death. The only chance of saving life in such a case would seem to be to thrust the finger or swab forcibly into the hole left by the removal of the tonsil so as to arrest the haemorrhage, and to open up the neck from the outside and attempt to find the bleeding vessel.

Second. Haemorrhage may take place suddenly and violently some few days after operation, and may be repeated. In some cases the bleeding has stopped spontaneously, in others when the patient became faint. "I have never," he says, "found it necessary to adopt any surgical procedure in any case of this kind."

Third. In secondary haemorrhage, Butlin is against the ligature of the carotid artery. To sum up, he says: "I have made a careful study of the literature relating to such cases, particularly of those in which heroic measures have been adopted, with the conclusion that the only cases in which they were justifiable were those in which sudden and violent haemorrhage immediately followed the performance of the operation."

With regard to Butlin's statement that the bleeding points should be sought for in the neck, and the artery not be tied in continuity, the following two cases may be quoted in support of that view. The first case is one of severe haemorrhage immediately following operation on the tonsils and adenoids, the second a war wound of the neck which gave the same clinical picture as that of an uncontrollable haemorrhage from the tonsillar fossa.

CASE I.

This case has been previously reported by Harmer. A child was operated on for enlarged tonsils and adenoids at the Metropolitan Hospital. After the tonsils had been cut with the guillotine an attempt was made to remove a large pad of adenoids with Löwenberg's forceps. This caused violent haemorrhage. Pressure was applied. The child became blanched and pulseless, and the bleeding ceased. Mr. Harmer was sent for; on his arrival the girl, who had not bled in the interval, suddenly started bleeding furiously, and died in a few seconds.

A *post-mortem* examination was made, which showed that a loop of the internal carotid artery, which projected into the pharynx, had been completely severed, so that a segment of the artery had been removed by the forceps. The cut ends of the artery had immediately retracted.

In this case, which was a wound of the internal carotid artery, the cut ends had so far retracted that they could not be seized from the pharynx. Ligature of the common carotid or the proximal end of the internal carotid would not have controlled the haemorrhage, as the cut upper end would have continued to bleed owing to the free anastomosis with the opposite side through the circle of Willis. The only method of treatment in this case would have been to control the haemorrhage in the pharynx with pressure, either with a swab or the thumb, while an attempt was made to cut down upon the carotid artery and find and tie the bleeding points in the neck.

CASE II.

Though the haemorrhage in this case was due to a war wound and not to an operation on the tonsil, the clinical picture was similar enough to show that ligation of the external carotid in continuity below the wound is not sufficient to control the haemorrhage from the wound of the vessel above. I plead in extenuation for quoting this case the extreme rarity of the occasion arising in tonsil operations for ligation of the external carotid.

The patient, an adult, was wounded on the left side of the neck by a small splinter of shell, which had damaged the external carotid artery and had caused a small traumatic aneurysm of that artery. The entrance wound had dried and was clean, but the further progress of the shell fragment had caused a wound of the lateral pharyngeal wall, just behind the tonsil, which was in communication with the aneurysm, and through which blood continually leaked into the throat. Operation was therefore decided upon.

During the induction of anaesthesia the patient stopped breathing and air could not be forced in or out of the chest with artificial respiration. Tracheotomy was performed, when breathing recommenced, and on the patient's coughing a large blood clot was expelled from the larynx and lower pharynx, which had collected there during the induction of anaesthesia from the leaking aneurysm. The patient thereafter breathed quietly. An incision was made along the anterior border of the left sterno-mastoid muscle and the external carotid found and ligatured. The artery was then followed up and the aneurysm defined. In attempting to separate the aneurysm from the surrounding tissues the friable false coat of the aneurysm was torn; a furious bleeding occurred, which was apparently undiminished by the ligature of the vessel below. After some difficulty the artery above the aneurysm was found and ligated and the bleeding completely ceased. The wound was sutured and the patient made an uneventful recovery. This case simulates closely the wounding of the external carotid artery in removal of a tonsil, and shows the uselessness of mere proximal ligature of the vessel in such cases.

With regard to severe haemorrhage during the first or second day, if the haemorrhage is so severe that it cannot be controlled by some local method applied in the tonsil bed, the delay in getting the patient to the operating theatre and the induction of anaesthesia would probably prove fatal, as the success of ligature of the artery in the neck depends on immediate operation, while the bleeding is temporarily controlled by pressure in the tonsillar fossa. Hope of success is only possible when the patient is already anaesthetized in an operating theatre, with good light, the necessary instruments and assistance.

Turning now to the secondary haemorrhage, this is an occurrence which has happened to most of those who have performed operations upon the tonsil for a long period of time. It is surprising that with an open septic wound, or a septic cavity which is highly vascular, and which is never at rest, secondary haemorrhage is not more common. Let us not probe the mystery but be grateful.

Secondary haemorrhage from the tonsillar fossa is seldom very severe, but rather a steady ooze which is difficult to control owing to the friable nature of the septic tonsil bed and surrounding tissues. The collapse of the patient is out of all proportion to the amount of blood lost, and is due to sepsis. It is sepsis that we have to combat primarily. If the tonsillar fossa can be rendered less septic, the clots and sloughs removed, and pressure applied by some such method as ligature of the faucial pillars over a small plug of gauze, then if we can combat the local and general septic condition the bleeding will cease. Ligature of the carotid artery in continuity has been performed in such cases with little effect, the bleeding often continuing in spite of ligature. Lee Cohen, in the *Journal of the American Medical Association*, quotes a case in which he ligatured the common carotid artery in a case of severe secondary haemorrhage. The ligature of the vessel did not control the haemorrhage, and the patient died.

In patients suffering from the advanced sepsis which accompanies bad secondary haemorrhage it is unjustifiable to submit them to a severe surgical procedure which is of very doubtful value in stopping the bleeding, which will seriously militate against the recovery, and which may prove fatal.

To sum up, then, it would seem that the correct procedure to adopt in cases of immediate, very severe haemorrhage, uncontrollable in the tonsillar fossa, is the temporary arrest of the haemorrhage by pressure in the fossa and the immediate cutting down on and ligature of the divided vessel in the neck. If the bleeding point be not found it would be justifiable to compress the common, external and internal carotid arteries in rotation in the wound to see if compression of any one of them diminished the flow from the tonsillar fossa; if so, a ligature in continuity of that vessel might temporarily diminish the bleeding so as to allow of clotting, if the bleeding came from an abnormal facial artery of moderate size. In cases of delayed or secondary haemorrhage it would seem that ligature of the external or common carotid artery is not to be relied on and is unjustifiable.

TREATMENT OF COLLAPSE FOLLOWING SERIOUS LOSS OF BLOOD IN OPERATIONS ON THE TONSIL.

BY

T. H. JUST, F.R.C.S.,

London.

THE treatment of collapse following serious loss of blood from the tonsillar bed is a problem which every one who operates to any extent upon the throat will have to face during his practice. The physiology of collapse and shock is so complex and at the present time so debatable, and the cause of the condition of collapse which occurs after operation on the tonsils with subsequent serious haemorrhage is made up of so many factors, that it will be better not to analyse the condition, but to discuss the methods by which it may be treated. Collapse may follow serious loss of blood immediately after operation, or it may occur after secondary haemorrhage. These two conditions are totally different; they require different methods of treatment and will therefore be dealt with separately.

In regard to the treatment of collapse following serious loss of blood directly after operation, loss of blood, with

the consequent diminution of body fluids, is the chief cause of the collapse; before treatment of the collapse, therefore, the bleeding should be controlled. The three main essentials in the treatment of collapse are:

1. Absolute rest.
2. Warmth.
3. Supply of fluid to the body.

1. *Absolute Rest.*—The patient should be laid flat in bed, without a pillow, in a darkened room. A competent nurse should look after the patient. All anxious relatives should be rigidly excluded from the room, as they tend to make the patient restless. The patient should be treated with confidence, as any anxiety of those looking after a patient easily transmits itself to the patient, and restlessness ensues.

In adults morphine should be given, as this not only induces sleep but also diminishes the tendency to bleeding. Morphine (gr. 1/4) and atropine (gr. 1/100) may be given. The atropine tends to diminish the secretion of mucus at the back of the throat and so makes it unnecessary for the patient to clear his throat and allows greater rest to the part. Again, if the collapse is severe some observers prefer to give 1/30 gr. of strychnine with the morphine. In children, who tolerate morphine badly, nepenthe 3 to 10 minims, according to age, may be given; or potassium bromide gr. x, and chloral hydrate gr. v, per rectum in a small saline injection.

2. *Warmth.*—The patient should be lightly covered with previously warmed blankets and surrounded with hot-water bottles. If this fails to warm the patient, he should be cradled and warmed by means of electric resistance bulbs within the cradle.

3. *Fluids.*—For the cases of collapse of moderate degree rectal saline is the most effective method of supplying the patient with fluid. It is not advisable to give the patient large drinks by the mouth, as it tends to start bleeding and vomiting, and the pain of swallowing makes for restlessness. In cases of collapse of moderate degree it is better to under-treat than to over-treat your patient. If the bleeding is controlled and the patient can sleep, in the majority of cases the collapse will pass off and the above-mentioned treatment will prove effective.

Passing now to cases in which the collapse is of a very profound degree and the treatment outlined above proves ineffective, more active methods must be employed. The chief of these is intravenous infusion with (1) blood, (2) gum saline, or (3) normal or hypertonic saline.

1. The infusion of blood, either whole or citrated, is the most efficient method of dealing with collapse following severe haemorrhage. It is not necessary here to go into the technique of blood transfusion, but a few rules may be laid down for its use:

(1) When it is considered necessary to give blood do not wait, as blood given *in extremis* has not the same effect. If the patient has severe collapse a donor should be found whilst the less active treatment is being attempted. If the treatment proves ineffective the donor is present when the blood is most needed; if rest prove sufficient nothing is lost. (2) The patient's and the donor's blood should always be grouped. Try to get a donor of the same group as the patient; if not, let the donor be Group IV. If the group be not known, blood of a different group may be infused into the patient and symptoms arise which may cause the death of the patient. (3) At least 500 c.cm. of blood should be given. In an adult 750 c.cm. can be given if obtainable. (4) Absolute quiet should be enforced during and after blood transfusion.

2. Gum saline, which consists of gum acacia 50 grams, sodium chloride 9 grams, and tap water 1 litre, is readily sterilizable and will keep. It is not so effective as blood in cases of pure haemorrhage and its effects are not so lasting, but as a first measure which is easily to hand it is extremely useful. Five hundred cubic centimetres should be given intravenously, and if no improvement occur, blood should be given in half an hour or the gum infusion repeated.

3. With regard to intravenous saline infusion, the effect of the infusion into the vein in cases of collapse is so transient that if gum is available it should always be given in preference to saline.

Pituitrin, 1 c.cm., or injection of camphor, grs. ii or iii in sterile olive oil, may temporarily improve the patient until the infusion can be performed. Rest, sleep and warmth are all-important.

Collapse after secondary haemorrhage is due almost entirely to sepsis, and it is this condition rather than the loss of blood that must be combated. The bleeding should be stopped if possible and then treatment of the sepsis undertaken. Intravenous infusion of blood or gum are practically useless in this condition, gum being rather more effective than blood, but still disappointing. The patient should take as much fluid as possible by the mouth. If vomiting occurs and the patient is unable to retain much fluid, continuous subcutaneous injection of saline should be employed, as it is necessary to get fluid into the patient to dilute the toxins circulating in his blood. The infection is practically always due to the *Streptococcus pyogenes*. Therefore 50 c.cm. of antistreptococcic serum should be given both intravenously and subcutaneously. The sensitized streptococcus vaccine of Besredka should be given (if obtainable) in doses of 50, 100 and 500 millions on three successive days. If the antistreptococcic serum or the vaccine be not available, normal horse serum given intravenously in saline is helpful, but not to so great a degree. Some observers claim that the intravenous injection of 1 c.cm. of 1 in 1,000 hydrarg. perchlor. in saline is very effective in septicaemia; it should be given on successive days.

In addition to these methods of combating general sepsis, the local condition should of course be attended to and the tonsillar fossa kept as clean as possible. Rest and sleep are as important as in any other form of collapse. These few remarks may give some indications of the line of treatment to be adopted in dealing with cases of collapse following severe loss of blood from the tonsillar fossa.

THE PLACE OF THE ANAESTHETIST IN OPERATIONS ON THE TONSIL.

BY

G. A. H. BARTON, M.D.Brux., L.R.C.P., M.R.C.S.,

Anaesthetist to the Hampstead General Hospital, and lately to the Throat Hospital, Golden Square.

I SHALL deal with this subject from two aspects—the prevention and the arrest of haemorrhage. The former certainly falls within the anaesthetist's province and his ministrations go some way to make or mar the success of the surgeon's efforts. To be intelligently helpful he must avoid everything that may cause congestion in the tonsillar area. This involves such considerations as the choice of anaesthetic and method of administration, and the maintenance of a perfectly free airway. In the former connexion I would just say in passing that ethyl chloride given alone, while an excellent anaesthetic for those who wish to operate rapidly, leaves no time for dealing with haemorrhage, and so need not concern us here. Its tendency is of course at first to raise blood pressure and flush the small blood vessels, but this is generally followed by some circulatory depression which assists in the sealing up of bleeding points during the recovery stage.

For many years I regarded chloroform as the only suitable anaesthetic for these cases. There is this to be said for it in this connexion, that it lowers blood pressure, and, indeed, if pushed to the brink of the fourth degree of narcosis, haemorrhage will surely be negligible. But independently of the risks associated with chloroform there arises the question whether it is not, on the whole, better to maintain the blood pressure at a reasonable height during the operation, thus ensuring all points likely to bleed being secured at the time, and avoiding the risk of reactionary haemorrhage, perhaps involving renewed surgical procedures for its arrest. On the other hand, one does undoubtedly on occasion see fairly free haemorrhage with chloroform, due probably to the difficulty in some individuals of maintaining a sufficiently deep narcosis with a Junker's apparatus.

On the whole, I think that a properly conducted ether narcosis, in addition to being much safer, is better from the point of view under consideration. Of course, much depends on the method of administration. If you neglect to give atropine in sufficient dosage and proceed to induce anaesthesia with a Clover's inhaler, paying little regard to the oxygenation of the patient's blood, you are simply

asking for trouble. On the other hand, if the method recently advocated by Dr. Rood,[1] and strongly supported by Dr. Tilley and others, is carried out boldly and in all its detail, the prospects of haemorrhage during operation are no greater than with chloroform, and the quiet breathing and entire freedom from all reflex disturbances, attained at practically no risk, are of the greatest assistance to the surgeon.

With trifling modifications I have adopted this method for the past two years, and am convinced of its value from this and every point of view. At first I used to give morphine as a preliminary, but experience soon convinced me that the action of morphine on the respiratory centre hindered the development of the profound ether narcosis desired. Just a suspicion of ethyl chloride on the mask helps to abolish consciousness quickly and renders the induction more pleasant to the patient. The above remarks apply equally to ethanesal, which I have largely used during the past few months in place of ether.

Having settled the question of the anaesthetic, it remains for the anaesthetist during the operation to keep the airway as free as possible. Any respiratory obstruction causes venous engorgement and increases haemorrhage. The tongue must be kept forward. The effect of widely opening the gag must be observed and regulated. In some, obstruction immediately develops from this cause. Much depends on the position of the head; if this is well extended it is less likely to occur. From the anaesthetist's point of view the ideal position is the dorsal, with the head extended and resting on its vertex; the airway is unimpeded, the gag can be well opened, blood gravitates away from the glottis, and he can watch the progress of events, and meet emergencies half way.

Whether the anaesthetist shall be of assistance in the arrest of haemorrhage is a matter that rests with the surgeon. Some may resent his intrusion, others welcome it. If his co-operation is desired it is of first importance that, as far as possible, his hands should be free of other service and his mind of other cares.

To promote these objects let him therefore maintain anaesthesia with the safe drug ether, using a Shipway apparatus. This as a rule is quite easy when the really deep narcosis has been induced. Should any difficulty arise a hot-water jacket to the ether bottle will overcome it. He should work the bellows with his foot. Last, but not least, he requires a really suitable, self-retaining, easily adjustable gag with an attached terminal for the rubber tubing. The ordinary Doyen's gag has many imperfections and requires constant attention; it is difficult to readjust with one hand; the thickly leaded dental plates take up too much space, and their steep lateral curve encourages rotation; a tendency for the lower lip to get nipped between the plate and the teeth is a constant source of anxiety. To obviate these defects I have modified it somewhat. The instrument which I have devised is fitted with a spring and slide attachment, rendering it easily adjustable with one hand only; the leaden plates are much thinner, only gently curved from side to side, and provided with a little step that intervenes between the lip and the teeth. Once in position it practically requires no attention. Being provided with two suitably curved and nippled terminals it can be used on either side of the mouth, and there is little risk of the rubber tubing being displaced by the surgical manipulations.

Surgeons have frequently impressed on me the importance of not damaging the anterior pillars when sponging, and, however well developed one's tactus eruditus and sense of direction, a clear view of what one is doing has its advantages. In sponging I recognize two objects: First, the mopping up of blood when haemorrhage is free, to keep the airway clear. This is best done with a marine sponge, which soaks up more blood and entangles clots more readily than wool swabs. The other object is the exercise of pressure on the tonsillar bed during every brief interval in the surgical procedures. This is, I think, best done with gauze or wool mops. A good service of mounted swabs is desirable but not always obtainable. The anaesthetist should have with him a few pairs of sponge-holding forceps; with these he can readily pick up and throw out swabs from a little pile set out within easy reach. The toothed ring-slide sponge holder I regard as an abomination. It requires two hands to fix and remove the swab, which, when fixed, is often very insecure.

I conclude with an apology and a tribute. An apology for these very simple, commonplace remarks—perhaps more suitable for a clinical lecture than for this audience. An acknowledgement of the debt I owe to laryngologists. What little knowledge of these matters I possess have I not gleaned it—here an ear, there a sheaf—from members of this Section?

REFERENCE.

1 *Proc. Roy. Soc. Med.*, vol. xiii, No. 6.

INFLUENCE OF OPERATIVE TECHNIQUE IN THE PREVENTION OF HAEMORRHAGE.

BY

E. MUSGRAVE WOODMAN, M.S.Lond., F.R.C.S.,

Surgeon, Ear and Throat Department, General Hospital, Birmingham.

THERE are few experiences more terrifying to the patient than serious haemorrhage after removal of the tonsils. I can remember with vividness the salt taste in the mouth, the difficulty in breathing, the coughing and spluttering, and, above all, the sense of impending death which assailed the sufferer. Personal experience impressed these facts on my mind with an indelible pen. No trouble we can take is too great to avoid this distressing complication, and we owe it to our patients and to the credit of the operation to save them, if possible, from this disaster.

In my experience—but it is only a personal one—an increasing number of cases in children and adults tend to bleed after operation. Nor is this surprising considering the septic state of many of the tonsils we are required to remove. In thirty-two consecutive cases of adult tonsils I have examined bacteriologically before operation, pneumococci have grown in fifteen, streptococci in eleven, influenza bacilli in four cases, and diphtheria bacilli and *M. catarrhalis* once each.

Preliminary treatment is of value, but I attach not the slightest reliance on the use of serums or in drugs designed to increase the coagulability of the blood. In men the quantity of meat and tobacco consumed should be severely restricted. In doubtful adult cases the blood pressure and coagulation time should be known. A preliminary heavy dose of atropine (1/50 in men and 1/75 in women) is given and the throat sprayed with 10 per cent. cocaine.

In describing the following technique I gladly acknowledge the lead I have had from Mr. Tilley. The operation I adopt is one of dissection with ligature of the vessels, but without suture of the pillars.

The head is placed in the fully extended position and the tongue drawn out and a sandbag is placed under the shoulders. The tonsil is grasped with some form of vulsellum forceps and drawn out of its bed. The anterior and posterior pillars are carefully separated by fine-toothed forceps or curved scissors, and the main artery to the upper pole is isolated, clamped, and tied. The tonsil is then grasped with Hett's forceps, lifted out of its bed, and gradually teased away with blunt forceps, gauze dissection or a small scalpel, taking care to keep the blade of the knife directed against the capsule of the tonsil, and the separation is thus completed. Beyond indicating the general method, I have purposely refrained from entering into a discussion of operative details.

Each artery can be seen spurting immediately it is cut; it is clamped at once and tied. It is better to tie off each one as it is exposed. For practical purposes the arterial supply enters the tonsil in three groups. The artery to the superior pole is the main source of blood supply and should be clamped before being divided; it is very delicate and the tissues around it soft. If missed it retracts and is very difficult to pick up. The middle group is represented by one or more vessels; they are easily seen on the side wall of the fossa and picked up, and the tissues around are firm and take the forceps well. The artery to the lower pole forms the third bleeding point. It is often deep down, and the tongue has to be lifted with a retractor to get a clear view. When once exposed the tissue holds the forceps well and the vessel is easily tied.

Ligature of these vessels is not the difficult art it might be imagined, even in situations in which the sense of touch alone is available. Two simple rules greatly assist the object in view: (1) The point of the artery forceps must be always turned towards the centre of the mouth. (2) The catgut used should be fairly fine and strong and somewhat stiff; a loop is made and carried down over the point on the tip of the index finger by the sense of touch. If there is still a general ooze after all arterial bleeding has been arrested I apply a pad of adrenaline for a few seconds, swab the cavities out with tincture of benzoin and then insufflate with xeroform powder.

Advantages of the Operation.

1. The anaesthetic is absolutely safe; I have never had a moment's anxiety from this source; ether alone is given, and recovery is rapid and often without vomiting. I have never had a case of post-operative pneumonia.

2. All arterial bleeding is checked by the clean surgical process of ligature, and serious haemorrhage is almost impossible.

3. The anterior and posterior pillars can be preserved with accuracy in every case, and a perfect anatomical appearance in the throat remains even after enucleation of the most difficult tonsils.

4. This technique with its necessary instruments is available for the efficient arrest of haemorrhage in any mouth operation.

Disadvantages.

Let us consider frankly the objections to the operation:

1. The length of time required. Certainly it takes longer than a guillotine operation. It should never take more than a quarter of an hour, and in the easy tonsils usually removed by the Sluder method not more than five minutes are required. Is not the time well spent in making certain of the arrest of all haemorrhage and thus guarantee our patients against that universal nightmare?

2. The difficult anaesthetic. I should prefer to call it a specialized anaesthetic. The technique is not difficult; a deep open ether is pushed until the pupils are wide, and in my clinic it is maintained by a catheter passed through the nose and with the eyelet hole immediately above the larynx. By means of Shipway's apparatus or even a Junker's inhaler a strong stream of ether is delivered just above the larynx. By these means even the strongest man can be kept well under with the mouth wide open under ether alone. The absence of chloroform has an advantage both for the surgeon and the patient. The method is one slightly modified from that used by Dr. Rood of University College. A great advantage of ether is that the blood pressure is at its highest during the operation and falls after the anaesthetic is over; haemorrhage, therefore, that is arrested at the time is unlikely to occur after the patient is returned to bed.

3. The difficulty of the technique. Again, it really is a difficult operation in many cases, but a mastery of this technique renders the task of tackling any operation in the mouth easy, and is well worth acquiring. It gives the operator singular pleasure in its performance, and the result when accomplished is all that could be wished for.

4. It is an unnecessary surgical procedure when simpler methods avail. I agree that in many cases of children the Sluder method is all that can be desired. Dissection should be reserved for those cases when a doubtful history of bleeding is present, or in cases of small highly septic tonsils. In my own practice I dissect all adult tonsils, or those in which the tonsils have previously been partially and inefficiently removed. I regret to say that cases of large and comparatively aseptic tonsils—the delight of all throat surgeons—come with increasing rareness into my hands.

The treatment of post-operative haemorrhage is reduced to comparatively simple means. If the haemorrhage has not quickly stopped with local haemostatics I advise the ligature of the bleeding vessels. Open ether is given, and an anaesthetic is taken easily and with avidity. It is far better to do this at once rather than that the patient should be exhausted by fruitless and painful efforts at local applications, and the whole operation is a matter of a few minutes only.

I greatly prefer to ligature the vessels rather than to close the tonsil beds by sutures, and my reasons are as follow:

1. The anatomical appearance of the throat is better preserved without suture.
2. Freedom of the anterior and posterior pillars with the muscles they contain is necessary for comfort in the throat and for the singing voice.
3. There is a danger of sepsis when closing in a septic cavity by sutures sufficiently closely placed to arrest haemorrhage.
4. There is some risk of injury to vessels running deep to the tonsil bed when passing the curved needle, especially when the tonsil bed is soft and friable from septic infiltration.

Lastly, the main point of my paper can be summed up in one word—if we are to avoid haemorrhage in all cases we must tie the vessels, and the technical skill so acquired is invaluable in the arrest of established haemorrhage either in our own cases or in those of our colleagues to whose assistance we may be called.

AN ARTERY FORCEPS FOR LIGATURES IN THE TONSILLAR BED.

BY

GILBERT CHUBB, F.R.C.S.,

Surgeon to the Throat Hospital, Golden Square.

In general surgery the method of choice for obtaining haemostasis is the artery forceps and ligature. That this method is not more commonly employed in tonsillectomy is due partly to the haemorrhage sometimes appearing to be a general ooze from the tonsillar bed, partly to the undoubted technical difficulty of the procedure in this situation.

The first difficulty, when it exists, is usually due to excessive trauma of the muscular tissue of the tonsillar bed. More frequently, however, it is only apparent, and a careful inspection will reveal one or more discrete points as the source of the haemorrhage.

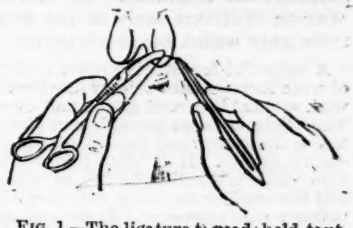


FIG. 1.—The ligature thread, held taut by either hand, being passed under the point of the forceps holding the bleeding point.

The second difficulty is largely overcome by the technique described by Mr. Tilley, in which the ligature thread, held taut at either end, is passed under the point of the artery forceps in the manner shown in Fig. 1. In the case of the ordinary artery forceps, however, it is often difficult to retain the thread under the point of the forceps while the knot is tied. Either so little tissue is taken that the necessary tension on the ligature and counter pressure upon the forceps results in the detachment of the latter, or else so large a bite is taken that it is impossible to get the ligature under the point of the forceps at all.

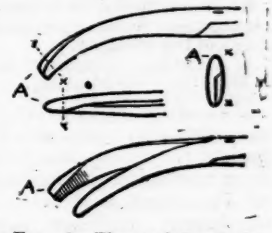


FIG. 2.—The point of the forceps, seen from the side, from above, and open. A section immediately behind the point is also shown. The point "A" always projects above the tissue however large a bite is taken.

The modified artery forceps now described does away with both these difficulties. However great a bite is taken there is always a point (marked "A" in Fig. 2) which is available for the retention of the thread. No counter pressure is required upon the forceps, and only the slightest tension upon the ligature. With this instrument I habitually tie the ligatures unaided. Fig. 2 shows the manner in which the exposure of the point "A" above the tissue is ensured, and shows also the converging lines down which the first knot of the ligature readily slips as it is tightened. The instrument has been made for me by Messrs. Mayer and Phelps.

THE USE OF THE CLAMP IN THE TREATMENT OF TONSILLAR HAEMORRHAGE.

BY

E. WATSON-WILLIAMS, M.C., M.B.,

Registrar, Ear, Nose and Throat Dept., Bristol Royal Infirmary.

ONE is, of course, in full agreement with the speakers who have pointed out the value of careful selection of cases, and of operation under ether, tying bleeding points, and completing a surgical toilet of the tonsillar bed before sending the patient from the operating theatre. Unfortunately, in the first place, in hospital work it is not always possible to attain this ideal. Many cases are still of necessity submitted to operation in the out-patient department, a short anaesthetic of gas or ethyl chloride alone being available. In such cases the full toilet is not possible. In the very great majority bleeding ceases in a minute or two when the gag is released. If it continues to be free the difficulties encountered with a vigorous and thoroughly frightened child are not few.

Rarely cases occur in which, after a careful dissection or guillotine enucleation, bleeding has apparently been arrested and the patient is sent back to bed. A few hours later—or, it may be, with separation of a slough a few days later—a further bleeding more or less sharp occurs. In such a case the position is more serious, as skilled assistance may not be at hand.

Whatever method we adopt for the control of severe bleeding, whether ligation or suture, these require anaesthesia and time, and their facility certainly depends on the skill of the operator. Either as a sole method of treatment or as a preliminary to other methods some form of tonsil clamp is of great value.

The clamp usually known consists of a hemispherical metal button on one leg of a pair of forceps; this is applied

to the bleeding point while the other leg provides counter-pressure by a flat plate outside the jaw. Unfortunately only a small part of the tonsil bed is compressed in this way, and it must often be a matter of some difficulty to hit off the exact point. Considerable pressure on so small a surface is ill tolerated. To meet these objections Dr. P. Watson-Williams early in the present century introduced the clamp which bears his name.

A large flat fenestrated blade is mounted on each leg of a pair of wide forceps with scissor handles. These blades are padded with several layers of gauze and even pressure thus obtained. The blade is large enough completely to cover the tonsil bed; to use the clamp one pad is placed on the tonsil bed, and the clamp closed. It is thus really a device for holding a swab firmly in the tonsil bed. No accurate application is necessary, and the smaller degree of pressure needed with this instrument is fairly well tolerated. If desired, haemostatics can be spread on the pad. It has been left *in situ* for eighteen and even twenty-four hours without ill effects and without great discomfort.

The advantages of the clamp may be briefly summarized:

1. Ease—it can be applied by an intelligent nurse; it certainly does not need any special knowledge to use it.
2. Rapidity—a few seconds suffice to clamp one or even both tonsil beds.
3. Efficiency—all bleeding is immediately arrested.
4. The clamp can be used as the sole treatment of haemorrhage.
5. Alternatively, it is very valuable to be able to apply a clamp while making preparations for further operative treatment of the bleeding.
6. Alternate clamping of both sides may help to decide which is bleeding if doubt arises.

The sense of security which this instrument gives is very valuable. One can be left at the bedside of every patient for twenty-four hours after operation. It is a great boon to feel that if bleeding occurs one will get a message to the effect that it has been arrested, not that it continues. Whether any further treatment is ever necessary is debatable. A series of several thousand cases in Bristol have not produced an example. As a simple, rapid and effective method of dealing with tonsillar haemorrhage the clamp is indispensable. It is, in fact, the laryngologist's tourniquet.

OBSERVATIONS ON OSSICULECTOMY.

BY

Sir JAMES DUNDAS-GRANT, F.R.C.S.,
Consulting Surgeon to the Central London Ear and Throat Hospital.

SIR JAMES DUNDAS-GRANT said that although ossiculectomy appeared to be considered out-of-date, he was convinced that in suitable cases it was of the utmost value. He considered that the indications for ossiculectomy were in cases when, as a result of suppurative inflammation, the ossicles were fixed so as to interfere with hearing power by impeding the mobility of the stapes, or to interfere with the application of the artificial drum; also in cases when by their presence they blocked up the outlet of the attic and prevented the escape of thickened discharge or cholesteatomatous collections, producing vertigo, headache, or other correlated disturbances. These were the practical indications, although it was usual to give a prior place to caries of the ossicles. Theoretically this last seemed the most obvious indication, but the diagnosis was very uncertain and the influence of the conditions somewhat doubtful.

CLINICAL NOTES ON CASES.

SIR JAMES DUNDAS-GRANT described a case of suppuration in a subdivided maxillary antrum with "nasal ganglion neurosis" suggesting malignant disease. The patient complained of very severe pain in the upper part of the left nasal fossa, of over a year's duration, and there was great suspicion of an early development of malignant neoplasm. The antrum was opened and a bony partition was found shutting off the posterior half of the cavity, behind which was a quantity of broken-down granulation-like tissue bathed in pus. The pathologist to whom it was referred reported that there was no sign of new growth or tubercle, and eventually recovery was complete.

Mr. W. FRANK WILSON (Newcastle) read a paper on a fatal case of a "shawl pin" in the oesophagus. The object of his paper, he said, was to point out the danger of the "blind attempt" to extract foreign bodies from the gullet; in this case attempts had been made in another hospital to recover the pin by a coin-catcher, which got stuck and required an anaesthetic before it could be withdrawn, the pin remaining behind. Five days after the accident happened the patient was removed to the Newcastle Royal Infirmary, but on account of symptoms of acute septic infection it was considered inadvisable to attempt oesophagoscopy. Gastrostomy, however, was performed when the symptoms had improved a few days later, but a purulent discharge continued to come from the throat, acute general peritonitis supervened, and death occurred eight days after the gastrostomy. At the *post-mortem* examination there was found an impacted foreign body in the oesophagus, purulent mediastinitis, empyema, and acute peritonitis. He pointed out the necessity in cases of this type for a thorough *x*-ray examination, and considered that coin-catchers, umbrella probangs, and similar instruments should now be considered definitely obsolete. He remarked that in cases of this nature inability to swallow at all, or ability to swallow with pain and difficulty the merest sip of water, indicates a grave injury to the gullet, independently of the size of the foreign body.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

ANTHRAX IN THE NASAL CAVITY.

(*Abridged.*)

I VENTURE to present the following case as one of interest from the point of view of the localization of the lesion. The patient, aged 35, a crossing-sweeper, came to my out-patient department of the Turkish Faculté de Médecine, at Haidar Pasha, Constantinople. Six days previously he noticed a swelling situated on the right side of the face, and a right nasal obstruction, accompanied by a discharge of mucus and blood. Until that date he had been in good health and had no contact with animals.

His face was pale and his expression drawn, and on examination I discovered a diffuse and flaccid swelling over the malar, lower eyelid, and submaxillary region. That portion of the neck near the manubrium sterni was equally oedematous. The right nasal cavity was obliterated by a fibrinous mass (infiltrated by a secretion of blood and mucus), some of which could be easily detached, but part was firmly adherent to the concha inferior, which bled slightly in an endeavour to remove it with the forceps. The mucous surface of the concha inferior was superficially ulcerated towards the apex and the whole mucous membrane congested, while here and there it was eroded to such an extent that even with the removal of the detachable portion the man was unable to breathe through that nostril. On the left side and in the throat there were no signs of infiltration. His pulse was 120, his temperature 104°. No evident organic pulmonary or cardiac lesions were present. The spleen was slightly palpable.

The immediate examination of the nasal secretions showed the existence of the characteristic bacillus of anthrax and some streptococci. The culture from the nasal secretion grew some pure anthrax and nothing else. Irrigations of hydrogen peroxide were carried out, iodine applied locally, and injections of camphor, and brandy by the mouth were given, but ten hours after admission the patient died. He had shown signs of slight tetanic contractions of the limbs, and was in a toxic comatose state—signs which present themselves in the last stage of anthrax infection. Unfortunately, no *post-mortem* evidence could support this view, as the parents refused permission, but as far as could be ascertained before death, there were no signs in the lungs or viscera.

With the absence of other external and visceral signs it was, in my opinion, a case of primary localization of anthrax in the nasal cavity, followed by a toxaemia which caused his death. The existence of a pseudo-membranous growth and intense congestion of the mucous membrane with erosion dating from a week previous, suggested a nasal diphtheria, but the oedematous swelling with the typical pallor of the skin and an absence of adenitis gave me the impression of an anthrax infection. It could not be definitely elucidated in what way the bacillus was deposited in the nasal cavity, probably by infection from the fingers or by dust, and from this localization the toxaemia followed.

ZIA NOURY PASHA, M.D.,
Professor to the Oto-Laryngological Clinic.
Turkish Faculté de Médecine,
Haidar Pasha, Constantinople.

British Medical Association.

CLINICAL AND SCIENTIFIC PROCEEDINGS.

ZANZIBAR BRANCH.

A MEETING of the Zanzibar Branch of the British Medical Association was held at the Health Office Laboratories, Zanzibar, on May 10th, when an interesting pathological demonstration was held, followed by discussions. A series of specimens of liver, lung, spleen, and heart were shown to demonstrate echinococcosis in cattle; points raised in the subsequent discussion included the frequency of echinococcosis in milch cattle, the absence of *Taenia echinococcus* in dogs, and the rarity of the disease in cattle in Central Africa. There was evidence which pointed to the milch cows arriving with the infection from India; statistics of the frequency and situation of echinococcal cysts in cattle supplied by veterinary officers were quoted. Other specimens demonstrated included carcinoma of the liver in a Swahili, presented by Dr. Phippen; *Entamoeba histolytica* and *coli* with their cysts; trypanosomes found in cattle from Tanganyika territory, closely resembling *T. rhodesiensi*, trimorphic with post-nuclear forms; malaria, with markedly pigmented parasites and crescents, a heavy infection from Pemba; and a graph of ankylostomiasis.

Reviews.

A NEUROLOGICAL HANDBOOK.

DR. CAMPBELL THOMSON'S handbook on *Diseases of the Nervous System*[1] has been familiar to students and practitioners for some years. That a third edition has been called for recently is sufficient evidence of the useful place it fills, as a not too voluminous monograph on a special branch of medicine. The present edition is enlarged, and naturally contains much new material which has resulted both from recent research and from the extensive neurological experience provided by the war.

The earlier chapters dealing with anatomy and physiology, reflexes, rigidity and contractures, and the general functions of the brain, are brief and concise and very valuable as laying down important general principles. There is a short but useful chapter on the paths of infection of the central nervous system, where due recognition is paid to the work of Orr and Rows. Perhaps the chapter on the autonomic system is the least satisfactory part of this section of the book, and might have been expanded with advantage; nor can the chapter on lumbar puncture be considered quite adequate to the importance of the subject, and the various changes in the cerebro-spinal fluid in different diseases could have been described in greater detail; we find, for example, no reference to Lange's colloidal gold test.

The syphilitic diseases of the central nervous system are treated together in a separate section, an arrangement which has permitted them to be presented adequately and in a manner affording recognition of their importance and of the more modern views on their pathology. The accounts of the systemic diseases of the spinal cord, of disseminated sclerosis, and of poliomyelitis are clear and satisfactory. We have noticed a few omissions and statements to which exception may fairly be taken. Thus the pathological foundation of paralysis agitans might have been stated more explicitly in view of the light thrown on this and allied conditions by the knowledge gained from the distribution of the lesions in encephalitis lethargica. In a description of the signs found in chorea we were surprised to read that "an extensor plantar response and hypotonus of muscles are indicative of lesions of the pyramidal tract." Hypotonus is no part of a pyramidal lesion, nor, we think, is an extensor plantar response commonly found in chorea. The lessons of the war and the recent developments of psychotherapy and psycho-analysis are utilized in bringing up to date the chapters on the functional nervous disorders. It is perhaps a little surprising to find the opinion still stated that "anaesthesia is the symptom most commonly found in hysteria." By inclusion of a chapter on encephalitis lethargica and reference to Dr. Head's new views on aphasia, as well as other new material in neurology, the author has succeeded in embodying much fresh information. Though criticism of certain passages in such a book may be easy, yet, on the whole, it can be praised as providing in a moderate bulk a lucid presentation of its subject. To the student it will form a useful volume as it emphasizes the importance of those general principles of neurological diagnosis in which the ordinary textbooks of medicine are too often lacking. The illustrations are quite good and form a valuable addition to the book.

[1] *Diseases of the Nervous System.* By H. Campbell Thomson, M.D. Lond., F.R.C.P. Third edition, revised. London and New York: Cassell and Co., Ltd. 1921. (Cr. 8vo., pp. 583; 120 figures. 15s. net.)

DISEASES OF CHILDREN.

DR. SHEFFIELD'S *Diseases of Children*[2] represents the experience of nearly thirty years' work in New York, and aims at an early up-to-date representation of the subject to students and practitioners of medicine; thus, the preface states that "the fads and fetiches of the erratic reformer and senile reactionary are eliminated." The observations of others are quoted quite as freely as can be expected in a work of this size dealing with such a wide field, for although there are nearly 800 pages, the print is large; in fact, rightly or wrongly, the reader sometimes feels the want of the note of personal opinion that would naturally be expected from long apprenticeship in clinical investigation, and thus the book is less attractive than some of the existing and well-known treatises. The author has, however, struck out a new line in preferring the new name "hemorrhea congenita" for haemophilia, and in including under the heading "hemorrhea acquisita" the various forms of purpura, among which purpura fulminans is, contrary to the opinion generally held, said to be identical with Henoch's purpura, in which abdominal symptoms are prominent. Infantile scurvy is regarded as probably directly due to microbic infection or toxaemia resulting from intestinal putrefaction, and disposed to by malnutrition and a diet deficient in vitamins. In the description of "pestis Americana," the unfamiliar name employed for yellow fever, reference is made to Noguchi's recent work on the *Leptospira icteroides*; but the mild form of typhus described by Brill in New York is not mentioned. In the account of infection of the urinary tract with the colon bacillus, treatment by hexamine in combination with potassium citrate (3 to 5 grains of each) is recommended, but the essential factor in successful treatment is to render the urine alkaline, and for this larger doses of the citrate are required, and hexamine can then have no effect, for to be effective it requires an acid urine. The best feature of the volume is the illustrations, which are mainly original, though some of the coloured plates, showing the naked-eye character of the stools, are due to the courtesy of Dr. Hector Charles Cameron.

[2] *Diseases of Children.* Designed for the use of Students and Practitioners of Medicine. By Herman B. Sheffield, M.D. London: Henry Kimpton. 1921. (Med. 8vo, pp. 798; 238 figures, 9 coloured plates. 48s. net.)

BURKE AND HARE.

ON November 3rd, 1828, the Edinburgh *Evening Courant* startled its readers by an account of the arrest of two men charged with the murder of a woman whose body was found at Dr. R. Knox's dissecting rooms. The publication among Notable British Trials of Mr. ROUGHEAD'S *Burke and Hare*[3] must revive interest in the career of these extraordinary criminals — extraordinary because of the motive of their crimes.

In all the accounts of the murders and of the contemporary occurrences recorded in Mr. Roughead's book the reader of to-day is struck by the absence of even an attempt at regulation of the proceedings consequent upon a death, such as registration and disposal of the body. This laxity rendered the sale to anatomists of unburied corpses easy and safe, and so little seems to have been thought of such a course, that Syme, as we are told,

[3] *Burke and Hare.* Edited by William Roughead. Edinburgh and London: William Hodge and Co., Ltd. (Demy 8vo, pp. 280; 13 illustrations. 10s. 6d. net.)

attempted to arrange for a supply of subjects by buying the bodies of poor persons who died from natural causes directly from their relatives. Sentiment and the custom of "waking" the corpse frustrated Syme's plan, but it seems that there would have been no legal objection to it. The resurrection men normally provided the schools with anatomical material, and their activities were supplemented by the amateur enterprise of zealous medical students, among whom in Edinburgh Robert Liston was as bold and successful as a body-snatcher as he afterwards became as a surgeon. But Burke and Hare were neither of them resurrectionists. These two drunken Irish workmen appear quite accidentally to have hit upon an easy way of getting a living without hard work. An old pensioner having died in Hare's tenement in debt to his landlord, the latter, with the aid of his friend Burke, in order to repay himself stole the body out of the coffin and sold it to Dr. Knox for £7 10s. He was told to "bring more"! The pair next assisted a sick man to be rid of the mortal disease of life by means of a pillow, and after that entered upon a course of brutal and cold-blooded murder, which by their own confessions in nine months cost thirteen women, two men, and one boy their lives; the bodies were easily disposed of to Dr. Knox and his assistants for £10 each without any awkward questions being asked. The usual course was to decoy the victim to their den — Burke seems to have been well endowed with powers of blarney—to make her drunk upon whisky, and then to suffocate her, one ruffian holding his hands over the mouth and nose of the victim, while the other lay upon her chest and abdomen, compressing them and frustrating the efforts of the limbs to free the respiratory apparatus. Mrs. Hare and Burke's paramour McDougal were certainly accomplices who helped to decoy the women and richly deserved the hanging which unfortunately they and Hare escaped. It is noteworthy that most of the victims were women. They were, perhaps, more easily cajoled by impudence and sham friendliness, and they were certainly easier to overpower and to transport when dead, while their bodies fetched as good a price as those of males. It is significant that in the case of Daft Jamie, the last but one of the series and the only able-bodied adult male victim, a very severe struggle took place before the murder was consummated.

It is commonly said, and with truth, that the receiver is worse than the thief. What, then, shall be said of Dr. Knox, who, in the course of nine months, bought sixteen unburied bodies from the murderers—bodies showing no sign of mortal disease, some of them not yet cold, and two of them those of persons known to his assistants to have been alive and well on the previous day? Mr. Roughead holds—and we agree with him and with Christopher North—that the best that can be said for Knox is that he was criminally negligent. It seems clear that he not only avoided inquiry as to the cause of death, but that he even prevented its being made by others. That neither he nor any of his assistants was charged with being an accessory after the fact is astonishing. In excuse of Knox it may be urged that the bodies of Burke and Hare's victims formed but a small proportion of the subjects supplied to his school. The needs of Edinburgh were so great that Scotland could not satisfy them, and bodies were shipped thither from as far off as Ireland and London. In that mine of information on this subject, *The Diary of a Resurrectionist*, edited by the late Mr. J. B. Bailey, there are various entries such as "Pack'd 4 and sent them to Edinborough," and "Sent 12 to the wharf for the above place." This was in 1811. What condition the bodies were in on delivery in Edinburgh may be imagined, seeing that the Leith packet was sometimes as long as six weeks in making the passage owing to contrary winds. Indeed, it would appear that some of the bodies supplied by the resurrection men cannot have been of much value for minute dissection, seeing that some of them were exhumed after they had been buried for months. The diarist records sorrowfully in more than one entry that the corpse was not marketable owing to its putridity.

Knox was a brilliant anatomist and lecturer, *primus et incomparabilis*. He had hitherto had a most successful career; his lectures in the extramural school at one time attracted more than five hundred students, and quite outshone those of the University lecturer, the third Munro, who probably owed his appointment more to nepotism than merit. Although of a jealous and cantankerous nature and quarrelsome with those of his own standing, Knox was popular with his students, who warmly espoused his cause and testified their faith by subscribing for the purchase of a gold cup, with which he was presented soon after the trial. But this was the culminating point of his career. From one cause and another he failed in Edinburgh and then in Glasgow, and drifted to London, where he appears to have eked out a precarious livelihood as a general practitioner at Hackney, and by lecturing at such places as Dr. Kahn's museum, a claptrap and somewhat indecent exhibition, which will be remembered by senior members of the profession as situated near the site of the London Pavilion Music Hall. He was at one time pathologist to the Cancer Hospital. In his latter years his former assistant, Sir William Fergusson, is said to have helped him pecuniarily from time to time. He died in 1862. His assistants, who must be held to share to some extent his culpability, all became well known in after-life, and one of them just mentioned rose to the very top of the surgical tree. Alexander Miller and Wharton Jones both achieved renown, the one in Edinburgh and the other in London.

In R. L. Stevenson's gruesome shocker, "The Body Snatcher," which appeared in the Christmas number of the *Pall Mall Gazette* for 1884, one of "Dr. K——'s assistants," Wolfe MacFarlane, appears in a very unfavourable light as a suspected murderer and a dissipated rake who afterwards became a celebrated London doctor. This description cannot be held to apply to Fergusson, but readers of the story when they hear of "the great man's still greater London Doctor" who had been assistant to "Dr. K——," could not fail to think of the President of the Royal College of Surgeons of England, Sergeant Surgeon to Her Majesty, F.R.S., and a baronet. Wharton Jones, despite his scientific attainments, never occupied a prominent position in the estimation of the lay public. Fergusson's connexion with the Burke and Hare scandal was not forgotten in Scotland, for when he came forward as a candidate for the representation of Peebles in the House of Commons he was driven from the hustings by cries of "Daft Jamie," and retired from the contest. This may have been the work of an astute election agent on the other side, but it could not have succeeded had not feeling been so strong that Fergusson could not stand against it.

Mr. Roughead says that the Anatomy Act, which put an end to the activities of Mr. Jerry Cruncher and his like, was the result of the disclosures made in the trial of Burke and Hare. It might have been expected that this would be so, but the astonishing fact is that it was not. A bill to regulate the supply of subjects for dissection passed the House of Commons in 1829 but was thrown out by the Lords. It needed the public indignation aroused by the crime of Bishop and Williams in 1830 to force the Anatomy Act of 1832 through both Houses of Parliament. Burke confessed to having killed a boy of 12, whose mother he had already smothered, by breaking his back. Dr. Knox and his assistants bought the body, as they had that of the mother, and neither suspected violence nor discovered the cause of death. At any rate they held their tongues. Bishop and Williams found less complaisant anatomists on the occasion of their attempt to emulate their Irish predecessors. When they took the body of the unfortunate Italian boy, whose neck they had broken, to King's College in London, the vigilance of Partridge and Beaman lead them to suspect foul play, to search for and discover the cause of death, and to secure the immediate arrest of the murderers.

Mr. Roughead's book contains some most interesting illustrations and much information on body-snatching in Scotland, as well as verbatim reports of the legal proceedings and much other matter. The impression left upon our non-legal mind is that the prosecution was bungled, and that with the evidence obtainable, which however was not all called, it should have been possible to convict all four of the accused, or, at least, to have avoided accepting Hare as King's evidence, and so letting this scoundrel loose upon the public. The book is appropriately dedicated to the Professor of Forensic Medicine in the University of Edinburgh, Dr. Harvey Littlejohn, whose acumen has been displayed in the unravelling of so many tangled stories of crime.

A TEXTBOOK OF PATHOLOGY.

THE second edition of the *Textbook of General Pathology*[4] by Drs. J. MARTIN BEATTIE and W. E. CARNEGIE DICKSON, will be welcomed by those who require a readable work containing in one volume up-to-date knowledge. The book is based on the teaching of the Edinburgh school, and is dedicated to the memory of the late Professor W. S. Greenfield, whose pupils and disciples the authors proudly acknowledge themselves to be. As in the previous edition the illustrations are on a generous scale, and fulfil their purpose admirably—a feature that should enable the reader to acquire the information he is seeking with a minimum of time and effort.

In order to include the advances made during the war the chapters on necrosis and gangrene have been expanded, and a series of new figures inserted to illustrate the process of repair and the varied cytology of inflammatory exudates. The section on tumours has been carefully revised, and here the illustrations are particularly good and helpful. The section on granuloma is excellent so far as it goes, but would have been improved had the authors included an illustration of lymphadenoma. The description of animal parasites is comprehensive, and particularly useful to a student preparing for examination.

Although in the present instance the authors have performed their task with a high degree of merit and success, the frontiers of pathology are being expanded at such a rate that before long it may be almost impossible to give a concise yet catholic description of the state of knowledge on even general pathology in a single volume. Possibly in the future the textbook of pathology will be divided into two portions—one dealing with the common lesions which everyone should know and know well, and the other being an appendix to which the rarer conditions are relegated. The objections to such an arrangement from the scientific point of view are obvious, but clearly the alternative is a series of volumes by a plurality of authors, each subject being dealt with by an expert. Such a work as Kolle and Wassermann's well known textbook of pathogenic micro-organisms, which runs to eight volumes, has still to be compiled for pathology.

It would seem that at the present time the tendency is more and more towards making pathology a science of the living rather than of the dead; undoubtedly a result of the unit system of teaching medicine and surgery is to emphasize the need of the utmost that pathology can offer in order to explain the symptoms and course of disease, and in order also, when possible, to furnish data and material for specific treatment. How great that requirement is to-day can readily be appreciated by those whose duty and privilege it is to assist, however imperfectly, professors of medicine and surgery in their arduous task of bringing to bear all available knowledge for the elucidation and treatment of individual cases of disease.

ACUTE ABDOMINAL AFFECTIONS.

THE little book, admirable in everything but its slangy title, in which Mr. ZACHARY COPE describes *The Early Diagnosis of the Acute Abdomen*,[5] should be in the hands of every practitioner and every student. It should be in their hands daily, for there is every inducement. The writing is simple and clear, the type and display are good, the arrangement of the matter plain, and the importance of the subject can be measured in lives saved. It is not to be expected that every surgeon would agree with every one of Mr. Cope's dicta, but every surgeon will agree with the great majority of them; which means that among his many readers support will be forthcoming for everything he says.

It is by no means easy to promise diagnosis and stick to diagnosis only; treatment for most authors will turn up like King Charles's head for Mr. Dick. Mr. Cope has been admirably severe with his pen in this respect, and is justified by the result. He opens with a chapter on the principles of diagnosis in acute abdominal disease, most aptly headed with Bacon's phrase, "There is surely no greater wisdom than well to time the beginnings and onsets of things." The first law, "Thou shalt make a serious and thorough attempt at diagnosis in every case," could we but incline our hearts to keep it, would, as he shows, soon solve the whole problem, for practice indeed makes perfect. Chapters II and III deal with the method of diagnosis. Forty pages are then devoted to appendicitis, thirty to perforated ulcers, and Chapter VII opens up the subject of intestinal obstruction; in turn, intussusception, cancer of the large bowel, and volvulus, strangulated and obstructed herniae, are considered; then abdominal emergencies of pregnancy and the puerperium, followed by cholecystitis and other causes of acute pain in the right upper quadrant of the abdomen; the colics; abdominal injuries; the acute abdomen in the tropics; acute abdominal disease with genito-urinary symptoms; spreading and general peritonitis; and finally, diseases which may simulate the acute abdomen.

It might be possible to find sins both of commission and omission, but the criticism would be captious. The reviewer read almost every word, and is sure the author's own experience is reflected, so that even in the few instances where it may not correspond with his own it is no matter, or rather, it is food for his own reflection. Let us repeat: an admirable little book.

DEEP RADIOTHERAPY.

A USEFUL and clearly written account of the technique of deep radiotherapy is contained in a small book[6] by Dr. CH. GUILBERT. Commencing with a definition of the maximum deep dose, he goes on to point out that it may be given either at one sitting or in a series, according to the condition of the patient. He then discusses the physics of deep radiotherapy, and the question of the distance of tube and the depth in regard to absorption of radiations; tables are given showing the diminution of radiations by absorption and dispersion calculated in relation to their passage through a centimetre of water. The third chapter discusses fully the various methods of measuring the output from an *x*-ray tube; the reasons why the more usual methods are insufficient are stated, and it is shown that the only reliable one is that based upon ionization. The ionto-quantimeter of Szilard is described and illustrated. The importance of filtration and the necessity for correct and suitable filters is made plain with the help of charts and tables; the practical point being to obtain as homogeneous a stream of *x* rays as possible. In a chapter on apparatus it is pointed out that the progress of the recent German technique in deep radiotherapy has been made possible by the perfection, during the past few years, of the *x*-ray tube; and that this has led to the construction of the apparatus designed by Dessauer, which is capable of an output of from 150,000 to 200,000 volts. The chapter which follows this—on cutaneous reaction—is largely based upon the work of Professor Wintz; the definite curative doses are stated, and it is pointed out that as cicatricial tissues are more sensitive to *x* rays than healthy, there is danger in carrying out the treatment after operation. Full details are given as regards accessory precautions to be taken for augmenting the safety of the patient. The final chapter deals with the different methods of the actual application of deep radiotherapy, portals of entry, and so on. The book concludes with a short account of the indications for this method of treatment, its dangers, and certain ill effects which it produces. Those interested in the late advances in deep *x*-ray therapy will find in this book a very clear account of the essentials which direct the way to a successful technique.

ALFRED NEWTON.

THE *Life of Alfred Newton*, by Dr. A. F. R. WOLLASTON,[7] with a preface by Sir ARCHIBALD GEIKIE, appears fourteen years after the death of this mid-Victorian zoologist, who, though professor of comparative anatomy at Cambridge for forty-one years (1866–1907), and a striking personality, did not come much in contact with the ordinary under-

[4] *A Textbook of General Pathology.* For the Use of Students and Practitioners. By J. Martin Beattie, M.A., M.D., and W. E. Carnegie Dickson, M.D., B.Sc., F.R.C.P.Edin. Second edition. London: William Heinemann (Medical Books), Ltd. 1921. (Roy. 8vo, pp. 511; 232 figures. 31s. 6d. net.)

[5] *The Early Diagnosis of the Acute Abdomen.* By Zachary Cope, M.D., M.S., F.R.C.S. London: Henry Frowde, and Hodder and Stoughton. 1921. (Demy 8vo., pp. 238; 38 figures. 12s. 6d. net.)

[6] *Technique de la Radiothérapie profonde.* Par le Dr. Ch. Guilbert, Chef de Laboratoire de Radiologie des Hôpitaux. Paris: J. B. Baillière et Fils. (Cr. 8vo, pp. 67; 20 figures. Fr. 4.)

[7] *Life of Alfred Newton.* By A. F. R. Wollaston, with a Preface by Sir Archibald Geikie, O.M. London: John Murray. 1921. (Pp. 352; 5 illustrations. 18s. net.)

graduate working at science with a view to medicine. Biology from at least 1880 onwards was more on the lines of comparative embryology and laboratory work than on those of the vertebrata and field work, and the latter, and particularly ornithology, appealed specially to Newton, who was more influenced by Gilbert White of Selborne than by anyone else. In ordinary life he was a strict Tory, a trait perhaps too strongly insisted on by Mr. A. C. Benson in his "Leaves from the Tree," which originally appeared in the *Cornhill Magazine* for 1911; but he was open to new ideas in connexion with his own subject and was one of the first eminent zoologists to accept and champion Charles Darwin's views. His investigations into the extinction of the gare-fowl, or the great auk, form an interesting chapter of an attractive book. Sir Arthur Shipley, now Master of Christ's, who was for a long time Professor Newton's demonstrator, has contributed a reminiscent account of his chief, and has reproduced the Cambridge of the late forties and early fifties. Dr. F. H. H. Guillemard writes sympathetically of a friend of nearly forty years' standing, and admits that in the light (or should it be darkness?) of these *post-bellum* days he must be counted an extinct type, as much as the great auk or dodo about which he delighted to write.

Dr. Wollaston has charmingly constructed this *Life* of his former teacher, which reads more like an autobiography, and is, indeed, in great part skilfully told by letters. The influence of Professor Newton, like the reader's interest in his story, was rather personal than academic. His biographer, by sympathetic and judicious use of the material at his disposal, has given us a full-length portrait of a great naturalist and a very human character.

NOTES ON BOOKS.

DR. NORMAN LUMB, in his *Gonococcal Infection in the Male*,[8] has contributed yet another to the large number of works on gonorrhoea available to students and practitioners. The aim in preparing this book has been to describe only those methods of treatment that have justified themselves by their results, and to describe them fully, so that a reader who is entirely ignorant of the subject will be enabled to carry out the treatment from the details given. The newer methods of treatment which have not yet proved their worth are merely mentioned or described briefly. Amongst the latter is ionization. Dr. Lumb's experience of this treatment has been that "in the acute stage disappearance of the purulent discharge resulted after six or seven times, but that the muco-purulent flow remained for a long period." We agree with the author that much unreliable evidence has been produced in support of electro-therapy, owing to the fact that cases have been regarded as cured without any sufficient bacteriological examination. In the chapters dealing with the complications of gonorrhoea the author furnishes an indication of their relative frequency from a large number of army cases, thus enabling the reader to obtain some idea of their importance in venereal practice. The chapters on the urethroscope contain much that has been already published in a former work; the instrument recommended is Wyndham Powell's. It is difficult to be original on a subject about which so much has been written in recent years as the subject of gonorrhoea, but Dr. Lumb's work at any rate has the merit of being clearly written and eminently practical.

The author of *The Technique of Psycho-analysis*,[9] Dr. SMITH ELY JELLIFFE, writes mainly for beginners. He deals with the subject principally as a method of obtaining knowledge of the causes of the behaviour of individuals, and has much to say as to when its use should be avoided. He is an experienced writer, with a profound knowledge of the literature of his theme, but the utility to students of his present work would be greatly increased by compression. There are so many statements in the nature of *obiter dicta* that a beginner might easily complete its perusal without obtaining any very clear view of what it is that the writer is mostly desirous he should learn.

In *Foot Care and Shoe Fitting*[10] Drs. W. L. MANN and S. A. FOLSOM provide a well illustrated and fully detailed account of nearly everything appertaining to marching capacity so far as it depends on the condition of the feet. Both the authors are officers in the navy of the United States of America, and many of the references are to matters with which we on this side have no acquaintance. Nevertheless, the authors give a great deal of general information, and make many observations of interest to all who are acquainted with the great importance of the subject considered. The number of these has been immensely increased by the experience of the late war.

Dr. D. A. CROW, in his small book on *Pyorrhoea Alveolaris in its Clinical Aspect*,[11] deals with the clinical signs, symptoms, and treatment of the disease. He makes a strong appeal to the medical profession for a more serious recognition of the many complications and diseases resultant from pyorrhoea. He is most drastic in his treatment, and we do not think he is justified in the extreme measures he always advocates. The illustrations of clinical conditions and the diagrams showing the surface area of teeth, and therefore the absorbing area in cases of pyorrhoea, are good. These latter were first shown by Mr. J. G. Turner some years ago. In a foreword Sir Frank Colyer says that the best treatment for pyorrhoea is to inculcate measures of prevention rather that wait for the disease to assert itself and then attempt a cure. We fully agree.

We have received the second quarterly number (June, 1921) of *Maternity and Child Welfare*, the organ of the Lady Chelmsford All-India League. The objects of the League are stated in the title. It hopes to further these aims by improving the methods of the uneducated *dhais*, or native midwives, whose services are the only help in childbirth available to the great majority of the women in India; by training female health visitors to work among *parda* women; by the organization of child welfare exhibitions; and by opening maternity homes. Membership is open to all ladies in India, European and Indian, and branches have been started in most of the principal cities. In several child welfare centres have been opened. Exhibitions have been successfully held in Delhi, Calcutta, and Bombay. How great is the scope for such work may be gathered from the statement that the mortality of infants during the first year of life is about 430 per 1,000 in Bombay, 360 in Madras, and 200 in smaller towns, as compared to about 90 in England. Besides the actual mortality, much blindness in India is due to ophthalmia neonatorum. An interesting account is given of measures taken in the Bijapur to prevent and, if necessary, to treat this disease, such measures necessitating the daily inspection, for five days after birth, of every child born in the town. Another article describes an attempt to continue the education of Indian girls in hygiene and first aid by special classes, conducted under the *parda* system for married girls, after leaving school. The proportion of Indian girls who attend school is small, and, of those who do, most cease attendance at about 10 or 11, an age at which education has hardly begun.

What is called the 12th–15th edition of GUTTMANN'S *Medizinische Terminologie*[12] has been issued. As we pointed out in noticing the previous edition, it is a German medical dictionary for the use of persons acquainted with that language. It does not give equivalents in other languages, except occasionally the Latin term. The price has been increased from 33 to 90 marks.

Messrs. SUTTLEY and SILVERLOCK, Ltd., of Blackfriars Road, London, S.E., have prepared a "Suttlock" register (price 7s. 6d.) for use by pharmacists and dealers in drugs under the Dangerous Drugs Act. The Act and the regulations made under it are printed in the volume, and there are a series of registers of the various transactions of wholesale and retail buying or selling of opium and its preparations and cocaine and its derivatives.

MESSRS. CASSELL AND CO., LTD., announce the twelfth, revised, edition of Bruce and Dilling's *Materia Medica and Therapeutics*.

[8] *Gonococcal Infection in the Male.* By Norman Lumb, O.B.E., M.B., B.S. 1920. London: John Bale, Sons and Danielsson, Ltd. (Demy 8vo, pp. 339; 165 figures. 25s. net.)

[9] *The Technique of Psycho-analysis.* By Smith Ely Jelliffe, M.D. Second, revised enlarged edition. Nervous and Mental Disease Monograph Series, No. 26. New York and Washington: Nervous and Mental Disease Publishing Company. (Med. 8vo, pp. 181. 2.50 dols.)

[10] *A Manual on Foot Care and Shoe Fitting.* By W. L. Mann, Ph.B., A.M., M.D., and S. A. Folsom, M.D 1920 Philadelphia: P. Blakiston's Sons and Co. (Cr. 8vo, pp. 124; 58 illustrations.)

[11] *Pyorrhoea Alveolaris in its Clinical Aspect.* By D. A. Crow, M.B., B.Ch Edin. London: Baillière, Tindall, and Cox. 1921. (Cr. 8vo, pp. 127; 14 figures. 6s. net.)

[12] *Medizinische Terminologie.* By Walter Guttmann. Berlin and Vienna: Urban and Schwarzenberg. 1920. (Roy. 8vo, pp. 1311; 464 figures. M.90.)

HEALTH OF LONDON IN 1920.

THE example of the Ministry of Health in expediting the issue of its annual reports is having a good effect elsewhere, and many medical officers of health are recognizing that the interest in a report decreases in proportion as the period to which it refers recedes from the date of issue. In pre-war days the report of the medical officer of health for the London County Council was often fourteen or fifteen months old and correspondingly stale; Dr. W. H. Hamer is therefore to be commended for speeding up his report for 1920, a copy of which reached us at the end of August.

Vital Statistics.

The population of the county of London estimated by the Registrar-General at the middle of 1920 was 4,531,971. It is now known that this was an overestimate, for the Census figures at the middle of 1921 were 4,483,249. An anticipated increase of 31,000 in 1920 since the 1911 census did not materialize, and there was an actual decrease of about 38,000. In a total population of 4,500,000 this overestimation is so slight that it hardly affects the statistics given in the report. The number of marriages registered in London during 1920 was 49,185, and the marriage rate of 22 per 1,000 of the population was well above that of the years immediately preceding the war. There were 120,529 births, equal to a rate of 26.4 per 1,000, compared with 18.2 per 1,000 in 1919 and 16.0 in 1918. The death rate was 12.6 per 1,000, and was the lowest recorded in London since the introduction of registration. In 1919 the death rate was 13.6 and in 1918 it was 19.2. There was an equally satisfactory decline in the infant mortality rate. In 1919 it was 85 per 1,000 births, the lowest ever recorded in London. In 1920 there was a still further drop to 76 per 1,000 births, which may be attributed to the increased activities of the maternity and child welfare workers. The result of these activities may best be seen in certain of the metropolitan boroughs. In ten years the rate has fallen in Shoreditch from 140 to 91, and in Bermondsey from 138 to 85. The lowest rate in 1920 was in Hampstead (48) and the highest in Bethnal Green (95).

Infectious Diseases.

Except in the case of small-pox and typhoid fever, there was a marked increase in the number of cases of the principal infectious diseases notified during the year. Of small-pox there were 19 cases in addition to 7 which occurred on board vessels arriving at the Port of London. There were 22,705 cases of scarlet fever and 207 deaths, compared with 12,935 cases and 147 deaths in 1919. Of diphtheria there were 13,780 cases and 1,023 deaths, compared with 9,459 cases and 775 deaths in 1919; and of measles the deaths were 1,016 in 1920 and 353 in 1919. The typhoid cases numbered 387 and the deaths 48 in 1920, and 342 and 63 respectively in 1919. It should be stated that the 1920 figures are for fifty-two weeks and the 1919 for fifty-three weeks. A great deal of pains seems to have been taken to trace the origin of the cases of small-pox, and in this connexion, as well as in the diagnosis of doubtful cases, the expert assistance of Dr. W. McC. Wanklyn appears to have been invaluable. Commenting on the inquiries which were made, Dr. Hamer refers to the great risks which are constantly arising of the introduction of small-pox into London through the importation of infected persons or material from abroad.

"The question may be raised as to how long it will be possible to keep small-pox at the present low figure. The answer is that under existing conditions there is a constant risk that small-pox will strongly reassert itself and assume a more prominent position than it does at present. Small-pox is a world disease. In British India in 1918 there were 93,000 deaths from small-pox. In this country, with its large influx of passengers from all parts, it can only be hoped to put off the evil day of the return of small-pox as long as possible; under present conditions it is not possible definitely to escape what is in effect a universal scourge. The case would be a very different one if general use were made of vaccination. Countries such as Holland and the Philippine Islands have rid themselves almost entirely of small-pox and any scare of it by means of vaccination, but our population is largely unprotected and is yearly becoming more so."

The behaviour of typhoid fever in London in 1920 has not caused Dr. Hamer to alter his opinion that the great decline of the disease in the latter half of the last century was due in the main to improvement in water and food supplies, and that the continued and accelerated fall of the last twenty years was mainly attributable to improvement effected as regards supplies of shellfish and fish from certain quarters. He combats the importance attached to "carriers," and also the opinion that preventive inoculation has caused a lowered incidence of the disease among young men since the war.

There were no cases of plague, cholera, or typhus fever in London in 1920, though two cases of the last-named disease were notified and admitted to one of the hospitals of the Metropolitan Asylums Board, where the diagnosis was revised after a period of observation. Since 1915, when 674 cases were notified, there has been a steady decline in the number of cases of cerebro-spinal fever occurring in London. In 1920 there were 144 definite cases, and 108 terminated fatally. In only 17 instances were the patients over 20 years of age, and 65 were under 3 years. Of encephalitis lethargica there were notified 149 cases, and the diagnosis was confirmed in 130 instances. The fatal cases numbered 48. The disease was most prevalent among those from 10 to 20 years of age, but the mortality was highest at ages above 40.

Tuberculosis.

The death rate from phthisis in the civil population of London in 1920 was 1.05 per 1,000, compared with 1.20 in 1919. The actual number of deaths was 4,791 and 5,332 in the two years respectively. Tuberculosis, other than phthisis, caused 954 deaths in 1920 and 992 in 1919. It is noticeable that the medical inspection in elementary schools discovered 155 cases of phthisis in 1920, and 352 in 1919. Of other forms of tuberculosis, 227 cases were discovered by the same means in 1920, and 575 in 1919. The County Council during 1920 passed important resolutions, modifying the tuberculosis scheme adopted in 1914. These include provision for the appointment of tuberculosis officers as assistants to the borough medical officers of health in order to secure a fuller measure of co-operation between the tuberculosis officer and the officers of the borough public health department; the prevention of the congestion at dispensaries owing to the retention of doubtful cases under observation for long periods and the prolonged treatment of patients by means of drugs; and more adequate arrangements for following up those patients who discontinue attendance at a dispensary. The congestion at dispensaries is to be met by making definite appointments with patients for their attendance and by establishing "consulting centres" to be equipped with "observation" beds and using the dispensaries more as centres for diagnosis and consultation than as treatment centres. There is also to be developed the fullest possible co-operation between the dispensary and the school medical service, so that all doubtful cases may be kept under observation at the school instead of the dispensary. The staffing of the dispensaries is to be so rearranged that the working week shall be thirty-six hours and the medical staff on the basis of one doctor for every 160 deaths from tuberculosis in the area served by the dispensary, part-time officers being employed for lower number of deaths.

Venereal Diseases.

The London County Council has participated since 1917 in a scheme for the diagnosis and treatment of cases of venereal disease with the county councils of Buckingham, Essex, Hertford, Kent, Middlesex, and Surrey, and the county borough councils of Croydon, East Ham, and West Ham, except that the Kent county council makes separate arrangements for diagnosis. Under this scheme there are twenty-eight hospitals and seven hostels where free treatment can be obtained. During 1920 there attended for the first time at the hospitals 23,612 London residents, or 2,704 more than in 1919. At the end of the year there were 297 practitioners on the approved list, who between them sent 11,234 pathological specimens for examination, a considerable increase upon the number sent in 1919.

A DEPARTMENTAL COMMITTEE appointed last January by the Board of Trade has made a report (Cmd. 1492, price 1d. net) on the question whether it is necessary or desirable to prescribe any limitations of the proportions of incombustible constituents supplied in gas. While the evidence received appeared to the Committee to indicate that for certain uses the harmful effect of CO_2 is very considerably greater than that of nitrogen, the Committee nevertheless judged it to be insufficient to enable it to determine at what point a limitation of the proportion of any or all incombustibles becomes necessary or desirable. In concluding a careful and well-considered report the Committee recommends that the matter should be reconsidered after an interval of three years, when the therm basis of charging for gas has become general throughout the United Kingdom.

British Medical Journal.

SATURDAY, SEPTEMBER 17TH, 1921.

CEREBRO-SPINAL FEVER AND MENINGOCOCCUS TYPES.

DURING the recent epidemic of cerebro-spinal fever in this country 98 per cent. of the strains of meningococcus obtained from military cases were found by M. H. Gordon and W. J. Tulloch to resolve, when submitted to the agglutination and absorption test, into one or other of four different groups or types; and P. Fildes found that meningococci present in naval cases were included within these same groups. From a study of meningococci derived chiefly from cases in the civil population, however, F. Griffith and W. M. Scott were led to dispute the sufficiency of this classification, because they found evidence of the existence of a number of intermediate strains. In view of this divergence of opinion it is of interest to note that the strains of meningococcus present during a recent outbreak of cerebro-spinal fever in Denmark were carefully studied with the agglutination and absorption test by Ferdinand Wulff[1] in the State Serum Institute at Copenhagen, under the direction of Professor Th. Madsen. Cultures of the meningococcus were examined from 80 cases of cerebro-spinal fever occurring in Copenhagen and its neighbourhood, 37 of the patients being under 15 years of age. It is noteworthy that 50 of these 80 cases developed rashes, chiefly of a petechial character, and that 19 of the patients suffered from septicaemia without meningitis.

Altogether 283 strains of meningococcus were investigated: 50 from the cerebro-spinal fluid of cases of meningitis, 13 from petechiae occurring in patients who developed septicaemia without meningitis, and 220 from the nasopharynx. These 283 strains were cultivated from 268 individuals—both nasopharyngeal and cerebro-spinal meningococci being isolated from 11 cases of cerebro-spinal fever, and both nasopharyngeal and petechial strains from 4 cases of meningococcal septicaemia. The cerebro-spinal and petechial strains, 63 in number, were differentiated into five types—A, B, C, D, E. To Type A belonged all the petechial strains and 46 of the 50 cerebro-spinal strains; the four others were all serologically different from one another. Out of 100 nasopharyngeal strains 93 belonged to Type A, 2 to Type D, and 5 to Type E. The grouping, therefore, was as follows:

Sources.	Types.				
	A.	B.	C.	D.	E.
Cerebro-spinal ...	46	1	1	1	1
Petechial	13	0	0	0	0
Nasopharyngeal ...	93	0	0	2	5
Total	152	1	1	3	6

In addition to the strains included in this table, the nasopharyngeal strain alone was isolated from 11 cases of meningitis and from 6 cases of septicaemia without meningitis. All of these 17 strains proved to be specimens of Type A, and accordingly the cases yielding them were regarded as due to that type. Thus out of 61 cases of meningitis 57 yielded Type A, and this same type was present in all of 19 cases of septicaemia without meningitis. Out of the 80 cases of cerebro-spinal fever investigated, therefore, no less than 76 were due to a single type of the meningococcus.

As regards carriers, 215 contacts of cases in the civil population showed 8 per cent. of carriers, 6 per cent. being carriers of Type A. Among 328 contacts of military cases the Type A carrier rate was 7 per cent. Out of 163 soldiers who had been on service for over a year, and who had not been in contact with patients suffering from cerebro-spinal fever, no less than 33 per cent. were found to be carriers, 15 per cent. being carriers of Type A. On the other hand, among 565 new entries coming from different parts of Denmark and swabbed one or two days after joining up, not one was found to carry Type A, although 7 per cent. of them carried other types of the meningococcus.

In 25 cases the question of the purity of the type infection was examined by testing a number of different colonies on the primary culture, and in every instance only a single type of the meningococcus was present. In all of 15 cases where the meningococcus present in the nasopharynx was compared with that in the cerebro-spinal fluid or petechiae of the same patient, their serological identity was established. The stability of the types was tested repeatedly during their cultivation for a period of two to twenty-one months and found to remain unaltered. In all of 21 carriers of Type A, who were examined repeatedly, the same type of meningococcus was present throughout. Nasopharyngeal cocci that did not conform to any of the five pathogenic types were also studied serologically by Wulff; their relations were found to be intricate, so that it was not possible to classify them into sharply defined types.

Since 95 per cent. of the Danish cases were found to be due to a single type of meningococcus, a striking feature of these observations is the evidence they afford of the value of the agglutination and absorption test for defining the prevalent infection in this outbreak of cerebro-spinal fever. A further feature is the confirmation which they offer of the chief points made out during the recent outbreak in this country as regards the monotypical character of the infection in individual cases, the stability of the types, and the serological diversity of nasopharyngeal micro-organisms with which the meningococcus is liable to be confounded. It is all the more interesting, therefore, to find that the prevalent type of the Danish outbreak differs serologically from any of the four types of meningococcus identified in our outbreak, specimens of which were sent to Professor Madsen by Dr. Gordon. We are informed by the latter, however, that through the courtesy of Professor Madsen he has had an opportunity of examining the chief strain of the Danish outbreak, and that while he agrees that it is serologically distinct from any of the specimens sent by him to Denmark, he has found that it agglutinates well with a serum prepared in 1916 against a strain of one of the subgroups of Type II defined by Tulloch. A few strains of this subgroup were obtained from cases at Liverpool about that time; but the type did not spread. It would seem from the observations of Wulff that the chief types prevalent during the recent outbreak in this country are rare in Denmark, and so far the type particularly prominent here when cerebro-spinal fever spread rapidly among troops in training in the early months of 1915—namely, Type I—does not appear to have been identified in Denmark in a single case.

[1] *Undersogelser over Meningococtyper.* Af. Ferd. Wulff. Gyldendalske, Boghandel, Copenhagen. 1921.

HEALTH AND LABOUR TURNOVER.

THE latest report[1] of the Industrial Fatigue Research Board is entitled "A statistical study of labour turnover in munition and other factories." In the preparation of the valuable series of reports which the Board has already published two sources of information have been relied upon. It has often been necessary to collect through the investigating staff current data of a kind suitable for the task in hand, but where appropriate records already existed, even though kept originally with a quite different object in view, these have been used. The present report has been based chiefly on a statistical examination of the employment records kept by certain national and controlled factories during the war. It also comprises, however, facts and figures drawn from certain other factories (all too few in number) where a complete system of record keeping is in force, and this has enabled some comparison to be made between peace-time and war-time periods of employment. The records deal almost exclusively with women workers.

Labour turnover, which is defined as the rate of change in the working staff, has a double bearing upon efficiency and fatigue. If high it implies much waste of time, for the time spent in teaching and learning a task must prove more profitable the longer the worker remains at her job after she has attained her highest degree of efficiency. Labour turnover may also be used, with certain limitations, as an index to the internal conditions of a factory, though fluctuations in the duration of employment are influenced by many external factors, such as the state of trade, competition for labour, and the habits of the working population in the neighbourhood. But variable factors of this kind, it is argued, affect the factory as a whole, and will not as a rule invalidate comparisons between the different departments in the same factory. It may, for instance, be found that the labour turnover in one department is continuously higher than that of the other departments, or that there has been an abrupt rise from the normal. The former effect may be due to such causes as fatigue or ill health following upon unduly long spells of work, defective hygienic conditions, or faulty selection of workers. The latter effect may be traced to some such cause of friction as the appointment of an unpopular departmental manager or foreman, or the introduction of a piece-rate which is regarded as unjust. The selection and maintenance of an efficient working staff is undoubtedly one of the most important problems in factory management. As Professor E. L. Collis said at the Guildhall discussion on industrial efficiency and hygiene, there is need of vocational selection of workers, and healthy working conditions make for a stable personnel.

As in a previous investigation by Dr. Major Greenwood, a feature common to all the labour turnover tables examined was found to be the high rate of loss in the first three months of service. This furnishes another argument in favour of vocational selection to discover the aptitude of applicants for employment, and as a large number of beginners leave from ill health or physical incapacity such tests should without doubt be accompanied by medical examination for fitness. As might be expected, ill health has an important bearing on labour turnover. A table in the report shows that the three-monthly rate of loss from this cause at one factory rose as high as 14.6 per cent. in the case of married women and 10.4 per cent. among single women; the figures for all the factories are high enough to suggest that more might often be done to lessen this source of wastage. The cases falling into this class were not attested by medical certificate, hence they could not be taken as a strictly accurate measure of sickness. An analysis of the sickness cases attested by medical certificates during a certain period tended to show that the incidence of sickness increased with the length of service. The increase was greater among married women and the general level higher; this, however, may have been due in part to age, as the average age of the married women was higher than that of the single women. From the results recorded, it seems clear that not only would the services of a medical officer be valuable to advise as to the physical capacity of each applicant, but continuous medical advice and supervision — as Dr. Rhoda Adamson showed in her work among women munition makers at Leeds—might do much to prevent breakdown at the later stages of service.

In his paper on the importance of industrial medicine to the community, read at the annual meeting of the British Medical Association at Newcastle, Professor Collis touched again upon the medical aspect of labour turnover. A heavy economic burden upon employers and employed has, he said, been recognized in the drift of workers from one place of employment to another. Workers newly engaged have more accidents and more sickness than the more permanent staffs; they are also less productive units. He showed that where medical supervision of entrants and hygienic conditions of employment exist the labour turnover can be reduced to less than a third of its present extent.

In the present investigation it was found that women doing heavy work had on the whole a better record than those in certain factories where lighter work was being done. Factories situated in different places under different local conditions are not, however, strictly comparable; further, such disturbing factors as lack of uniformity in recording facts cannot be altogether avoided. But, as the authors observe, the usefulness of their results lies in the points in which the factories are alike rather than those in which they differ. Thus it is established that the high leaving rate in the early months of service in factories is not confined to munition works or to the war period, but is also to be found in factories engaged in peace-time industries, and it is still a source of economic loss. Lastly, and this is perhaps of most significance, the labour wastage among women from such causes as ill health, incompetence, and dissatisfaction, is very large. The remedy for a good deal of the discontinuity of employment so arising may, it is thought, be found in organized welfare work under medical guidance. The general effect of the report is to suggest that periodical surveys of the labour turnover, if carried out systematically in different departments of each factory and founded on data carefully recorded, might prove of great value.

[1] Reports of the Industrial Fatigue Research Board. No. 13: A Statistical Study of Labour Turnover in Munition and Other Factories, by Gladys M. Broughton, Ethel M. Newbold, and Edith C. Allen. (General Series No. 4.) London: H.M. Stationery Office. Price 3s. net.

THE ROCKEFELLER FOUNDATION.

IN its work of furthering scientific truth in medicine the Rockefeller Foundation recognizes no frontiers. It endeavours to stimulate research by keeping open the channels of communication between men of science in different countries and different continents, and fosters the growth of educational and research institutions. It encourages the application of scientific knowledge to the practical needs of the community in general, and by

increasing the common store of the knowledge of disease and diffusing this information as widely as possible throughout the world, it seeks to aid the progress of international goodwill. In the year 1920, according to the review[1] of the work of the Foundation which is given in the well-written report by Dr. George E. Vincent, it aided six medical schools in Canada, gave £1,000,000 to University College Hospital, London, for the development of medical education, and established and maintained a modern medical school in Peking. It assisted the Government of Czecho-Slovakia to reorganize its public health system, and carried on campaigns against hookworm disease in Queensland and the West Indies, against yellow fever in South and Central America and West Africa, and against malaria in the southern States of the United States and the West Indies. France, where the war-time anti-tuberculosis work has been brought to a point where it can soon be left entirely in French hands; Belgium, where a million francs have been given for medical research and a contribution promised to the rebuilding of the medical school of Brussels University; Germany, Austria, Brazil, and other countries likewise owe a debt of gratitude to the Foundation for aid in different medical activities. The report explains how, following on the recommendations made in 1913 by the Royal Commission on University Education in London, together with certain other influences and considerations, the experiment was begun of establishing full-time clinical units in four of the London schools of medicine. Two representatives of the Rockefeller Foundation arrived in London at this juncture on their way to the Continent and, recognizing the possibilities in University College and the hospital and medical school, formed the opinion that it would be proper for the Rockefeller Foundation to provide funds for the development of the new system of teaching at that hospital. As the result of subsequent negotiations the trustees authorized the concluding of an agreement by which the Foundation promised to contribute about five million dollars towards the realization of the new plans of University College and the hospital and medical school, the sum being almost equally divided between the building and endowment for educational and research activities. As part of the understanding for the future the two separate bodies—the University College faculty and the hospital—are each to be represented in the other by at least four professors. An account of the details of this gift was given in a special article and a leading article in our issue of June 19th, 1920. The report expresses the hope that "this formal interlocking will be a symbol of the effective team-work between the university laboratory men and the bedside teachers upon which the success of this unique London medical centre will ultimately depend."

[1] *The Rockefeller Foundation: A Review for 1920.* By George E. Vincent, President of the Foundation. New York, 1921.

EXPERIMENTAL RICKETS.

MUCH work has been done on the pathogeny of rickets and many different views have been advocated; indeed it has been suggested that it would be hardly an exaggeration to assert that almost every specialist in children's diseases has his pet hypothesis as to the causal factor. The old conception that the diet is at fault, especially as regards deficiency in fats, protein, or calcium salts, has been assailed. Thus, from a comparison of the feeding of rickety and non-rickety infants Dr. L. Findlay and Miss Ferguson came to the conclusion that the evidence was against the view that a deficiency of milk, butter, the fat-soluble A substance or protein was a determining factor; following von Hansemann's theory of "domesticity" they laid stress on the importance of inadequate air and exercise in causing the metabolic error manifested in rickets. This conclusion was adversely criticized by the Medical Research Council's Committee upon Accessory Food Factors (Vitamins) (1918), which described rickets as a deficiency disease due to diets which are unbalanced in that they contain too little of those substances rich in the antirachitic factor, which has a similar distribution to the fat-soluble A factor, and is possibly identical with it, and too much of substances deficient in this respect, thus summarizing Dr. E. Mellanby's results. Recently Shipley, Park, McCollom, Simmonds and Parsons[1] found that by the use of faulty diets, especially those deficient in the fat-soluble A or in both that substance and calcium, a condition indistinguishable from human rickets could be produced in rats; they felt justified in concluding only that faulty nutrition was the cause of the observed bony changes. On the other hand, Drs. Zilva, Golding, Drummond and Coward[2]—using pigs, which are especially suitable for this purpose—while cautiously stating that their results do not justify any definite information on the relation of the fat-soluble factor to the etiology of rickets, were not able to induce undoubted rickets in sucking-pigs fed from birth on a diet rigorously restricted in the fat-soluble factor. From experiments on rats Sherman and Pappenheim[3] also throw doubt on the importance of a deficiency of the fat-soluble A substance in the production of rickets. By means of a simple diet, inadequate for growth in the amount and character of the protein and in the content of fat-soluble A, they constantly caused rickets in young rats, and then, solely by the substitution of 0.4 per cent. secondary calcium phosphate (K_2HPO_4) for a small part (one-seventh) of the calcium lactate present in this diet, completely prevented the development of rickets, though no effect was produced on the body weight. This is held to prove that rickets may be induced or prevented without change in either the protein or vitamin components of the diet, and, as had been shown previously by others, that an adequate supply of calcium does not in itself protect against the disease. The protective action of the potassium phosphate is not clear, and the authors carefully guard themselves from being thought to support the view that rickets is due to a deficiency of potassium or phosphorus. They suggest that the quantitative relation of the inorganic ions, rather than an absolute deficiency of any one of them, may be a determining factor, and that very possibly, under certain conditions of diet in which there is an unbalanced quantitative relationship of the organic as well as the inorganic foodstuffs, rickets may develop. They state definitely that their experiments and conclusions do not exclude the possibility of causes of rickets other than those discussed in this article. The recently published metabolic studies of rickets by Drs. L. Findlay, D. Noël Paton, and J. S. Sharpe[4] show that bony changes somewhat resembling rickets, but really of the nature of osteoporosis, and not of true rickets, can be caused by a calcium-low diet.

[1] *Journ. Biol. Chem.*, 1921, xlv, 343.
[2] S. S. Zilva, J. Golding, J. C. Drummond, and K. H. Coward, *Biochem. Journ.*, 1921, xv, 427.
[3] H. C. Sherman and A. M. Pappenheim, *Journ. Exper. Med.*, Baltimore, 1921, xxxiv, 189.
[4] *Quart. Journ. Med.*, Oxford, 1921, xiv, 352.

CHARLES CALDWELL, M.D.

HOWEVER edifying the lives of the virtuous and successful may be, there is often more interest in following the struggles of the erratic and gifted with adversities due to faults of temperament. Of such the life story of Charles Caldwell (1772–1853), as told by Dr. W. S. Middleton,[5] is an example; his biographer says of him that though by Nature's gifts and personal attainments he was one of the prominent men of his day, grim fate, well seconded by his own morbid spirit of controversy, has caused his name to be almost forgotten. He was of mixed French and Irish blood, being descended from the Colvilles; he was left an orphan at the early age of 14; quite undaunted, he took charge of a grammar school, thus recalling the much

[5] *Annals of Medical History*, New York, 1921, iii, 156–178.

lampooned Sir Richard Blackmore, who "first set up the whipping trade . . . in vain his drugs as well as birch he tried, his boys grew blockheads and his patients died." Caldwell had a magnificent physique and commanding presence, was an adept in all athletic exercises, courtly, an eloquent speaker, and a diligent worker. So far he had the makings of an Admirable Crichton, but his egotism was colossal, he was inconsistent, and so contentious as to be an impossible colleague. After preparing for the Presbyterian ministry he started medicine at Philadelphia at the age of 20, and paid diligent court to the great Benjamin Rush. In 1793 Philadelphia was ravaged by yellow fever, and Caldwell acted as a devoted nurse to the stricken patients; from the knowledge then gained he maintained that the disease was not directly contagious, thereby winning the approval of Rush, at whose suggestion he translated Blumenbach's *Physiology* from the difficult German-Latin text. Between 1793 and 1805 he had yellow fever three times; without grasping the causal relation he remarked the concomitant swarms of insects, especially of mosquitos, during epidemics of the fever, and advocated hygienic reform in Philadelphia and the drainage of swamps. In 1794 he acted as surgeon in the "whisky rebellion" in Western Pennsylvania, and as the result of personal experience recommended the cold water treatment of fever, thus anticipating James Currie (1797). Rush adopted this method without, it is alleged, giving Caldwell due credit, and their relations became strained, though subsequently, when, acting on a hint from Rush, he translated Senac's *Treatise on Remitting and Intermitting Fevers*, Caldwell dedicated the volume in flowery language to his former teacher. This peaceful interlude, however, was of short duration, for, failing to obtain the professorial chair vacated by Rush, he became embittered and launched out into controversies whenever an excuse arose. Though he was the author of the dictum, "Every man when in health may, if he please, bridle his tongue," yet in 1846 he confessed that for fifty-five years he had never been free from a contest against some opinions or doctrines which he considered to be erroneous. That he had a feud with Benjamin Smith Barton, at different times professor of botany and natural history, materia medica, and medicine, in Pennsylvania University, is not strange, for that preposterous person believed that swallows hibernate in the mud at the bottom of lakes or in tree stumps, and maintained also that goitre, as well as malaria, was miasmatic in origin. A rather pleasing instance of Caldwell's inconsistency is, that though his great disappointment was the failure to succeed Rush, he maintained an unswerving friendship with Chapman, who stepped into Rush's shoes. Although accused of "using more words to say nothing than any American of the last century," his egotistic autobiography provides a rich store of personal information about the prominent figures of Rush, Adam Kuhn, Joseph Priestley, and Caspar Wistar "the bustler," and the early days of the University of Pennsylvania. Caldwell was one of the progressives who in 1802 practised Jennerian vaccination; in the following year he started clinical teaching in the almshouses, but he was not, as has been asserted, the first in Philadelphia to start instruction on these now familiar lines. Opinions as to his abilities as a teacher vary, very possibly because he practised in so eminent a degree the gentle art of making enemies. In 1819 he left Philadelphia to take the chair of medicine at Lexington, where he became Dean of the Medical Faculty. In seven years he had the second largest medical school in the United States; but troubles arose, and in 1837 he migrated to Louisville to become professor of medicine, medical jurisprudence, and clinical medicine; but here again the atmosphere became heated and uncomfortable, and with the disadvantage of age his connexion was severed in 1849. He died after an attack of erysipelas in 1853, and was buried at Louisville "near the scenes of his last conquest and defeat."

"BACTERIUM PNEUMOSINTES."

IN the course of a prolonged investigation of the nasopharyngeal secretions of influenzal patients, eight reports on which have now appeared, Olitsky and Gates,[1] working at the Rockefeller Institute for Medical Research, have cultivated anaerobically, from secretions obtained within thirty-six hours of the onset of uncomplicated influenza, a minute filter-passing bacilloid body 0.15 to 0.3 microns in length with constant cultural characters and capable of indefinite propagation on artificial media. This organism, which has been named *Bacterium pneumosintes* (σίντης = injurer) and is not of the nature of ordinary bacteria, was also recovered from the unfiltered and filtered lung tissue of rabbits and guinea-pigs inoculated with unfiltered and filtered nasopharyngeal washings of patients in the early stage of influenza. It has also been obtained from cultures contaminated with various bacteria, such as the influenza bacillus, streptococci, pneumococci and staphylococci, and has been experimentally cultivated in symbiosis with them. Cultivation of material from controls, such as persons not suffering from influenza some of whom had acute coryza, and the lungs of rabbits, gave uniformly negative results. Intratracheal injections of mass cultures of this organism into rabbits and guinea-pigs induced changes in the blood and lungs indistinguishable from those obtained with the nasopharyngeal secretions of patients with early influenza. A noteworthy feature of the organism is that it reduces the resistance of the lung tissues of inoculated animals to accidental or experimental infection with ordinary bacteria—for example, those found in the pulmonary complications of influenza. Thus a series of rabbits injected intratracheally with a third generation of *Bacterium pneumosintes* were given twenty-four hours later, into the ear vein, small doses of a Type 4 pneumococcus or of the influenza bacillus which had proved subinfective for normal control animals; as a result there was more or less extensive lobar or bronchial consolidation, from which the organism injected into the ear vein was recovered, the rest of the lung showing the haemorrhagic oedema and emphysema characteristic of *B. pneumosintes* alone. In view of the discussion as to the virus of epidemic influenza—some, such as Opie, F. S. Lister, and Fildes and McIntosh, supporting the claims of *B. influenzae;* others, such as W. G. MacCallum, believing the virus to be an organism differing from those as yet described and ungrowable and unstainable; and others again pleading for a filter-passer—these observations are of the greatest interest. Olitsky and Gates preserve, however, a wise caution and refrain from the tempting conclusion, at any rate in the present state of knowledge, that the organism they describe is the real etiological agent of influenza.

[1] P. K. Olitsky and F. L. Gates, *Journ. Exper. Med.*, Baltimore, 1921, xxxiii, 713-729; xxxiv, 1-9.

READY-MADE REVIEWS.

THERE are various ways of reviewing books: at the one extreme we have Sheridan's advice, "you should never read a book before reviewing it, as it prejudices you so." Intermediate methods are to write some *ex cathedra* remarks on the subject, and leave the author's views to take care of themselves; or—a slight advance on this method—to abstract the preface. Finally, we have the honest review, containing a measured criticism written after absorbing the whole contents of the book. A reviewer has a considerable influence in determining the immediate sale of a work, but many examples of works ultimately successful which were damned by the critics on their first appearance might be quoted. Publishers are entitled to push the sale of their wares, and, though the parodist has stated that "sweet are the uses of advertisement," all the available methods are not equally attractive and some are not well advised in the interest of a new book. It might perhaps be urged that it is partly to save the busy editor of a journal or

his assistants the trouble of reading and expressing an opinion on a book that some publishers (not in this country) have adopted the custom of sending with the copies to be reviewed a printed or typed statement of the scope of the book, of the aim of the author, and of the success with which his efforts have been attended. Frequently this statement is accompanied by a request that it should be inserted in an early issue. How far this method may have borne the fruit desired we do not know, but as it is continued and as its use would seem to be extending, presumably it has not failed entirely. It is, however, possible that the reviewer may resent the publishers' suggestion to praise blindly, and be stimulated to look even meticulously for material suitable for criticism. In any case the practice is undesirable and it is possible that some reviewers might regard it as an insult to their intelligence, if not their integrity.

HEALTH AND HOUSING IN JOHANNESBURG.

IN his report for 1919–20 Dr. Charles Porter, Medical Officer of Health for Johannesburg, touches on several points of general interest. The chief event of the year was the enactment of the Public Health Act, due largely to the efforts of Sir Thomas Watt and Dr. J. A. Mitchell, now Secretary for Public Health. The Johannesburg death rate was 10.9 for whites, 17.5 for natives, 27.5 for Eurafricans, and 25 for Asiatics. This white death rate compared favourably with that of London and the great English towns, of Paris and New York, and also of the South African towns, except Durban (9.5) and Pretoria (9.2), both of which are relatively non-industrial and much less urbanized communities. The white infantile mortality was 81.4 per 1,000 births, as compared with 106 in the great English towns, 80 in Cape Town, 66.5 in Durban, and 84 in Pretoria. There was a mild recrudescence of small-pox in July and August, 1919, and several threatening outbreaks, which were limited, however, by the keenness of the infectious diseases staff, to a total of 77 cases. As regards enteric fever, regulations, for which the Council had long asked, have recently been gazetted for the control of "carriers." Dr. Porter draws attention to the nuisance from septic tanks, and particularly the danger of well-water pollution, having regard to the rapid urbanization of residential districts, the large and increasing number of borehole wells, and the contravention (often deliberate, it is said), both by architects and property owners, of the requirements of the by-laws. The main feature, however, of the report is the section on town planning and housing. A sketch is given of the progress of Johannesburg from a miners' camp in 1886, and the defects due to its hasty development and to the absence at that time of knowledge of town planning principles, which have resulted in "enormously costly street upkeep, dangerous rectangular 'collision' corners, disregard for street 'vistas,' and 'sweating of the land' by crowding of dwellings on site." The functions of the Township Board established in 1905, and the scope of the town planning section of the Public Health Act, 1919, are quoted, and the hope is expressed that wholesome regulations will soon be framed embodying various important principles, and incidentally checking the combination of "Queen Anne" front elevations of houses with unsightly "Mary Ann" backs. The Government Housing Committee of 1919 found much bad housing, shortage of houses and consequent overcrowding, and the Asiatic Inquiry Commission commented strongly upon the Malay location, which Dr. Porter calls a festering menace to the community. The Council's efforts during the past two years to face and solve the native and coloured housing question are recorded with approval. It appears that the Johannesburg Council has constant difficulty in securing much-needed sites, whether for native housing or other purposes, owing to the price demanded "rocketing" beyond all reason when the Council is the buyer. In New Zealand they have a short way with this kind of profiteering: the owner of land required is offered the Government rateable value, *plus* 10 to 20 per cent., and if he refuses this offer he must specify, and in future pay rates upon, his own valuation. Finally, Dr. Porter urges the importance of proper housing of natives, and then, but not before, the closing and demolition of slum property; the need for powers to control the influx of unemployed natives, and to take over, on reasonable terms, land required for public purposes; and the extension of the water-carriage system of sewage disposal.

FRUIT PRESERVATION.

THE report of the Food Investigation Board[1] for the year 1920 contains the results of the researches which have been conducted under its direction on different articles of diet, in addition to the rather more technical reports of the Engineering Committee and of the Oils and Fats Committee. The results so far published of the investigations on fish and meat preservation have already been noted in our columns, and the present report gives a full account of the researches which have been carried out in fruit preservation. Dr. Cyril West and Dr. Franklin Kidd have conducted experiments on the storage of English apples, and have found that for storage purposes 1° C. is the most satisfactory of the temperatures tested; a humidity of 85 per cent. saturation is better than a humidity of a smaller percentage for cold storage. In regard to the effect of cultural conditions upon storage, clay soil is preferable to chalk, and chalk preferable to fen land; wooden boxes were found to be more satisfactory for packing than stout cardboard cases; "gas" storage tests (storage in an average concentration of 14 per cent. carbon dioxide and about 8 per cent. oxygen) were so satisfactory that they are to be carried out next season on a commercial scale, this method of storage having approximately doubled the storage life of the varieties of apples tested. Mrs. Franklin Kidd, who studied diseases of gathered fruits, found that while apples grown on grass land showed only 4.5 per cent. of disease due to moulds, and 3.5 per cent. due to "gas-spot," apples grown on cultivated land were less resistant to diseases, 12 per cent. suffering from attacks from moulds, and 18 per cent. from "gas-spot." The Hon. Mrs. Onslow conducted an investigation on the oxidizing enzymes of fruit, with special reference to discoloration, and as a result she found that fruits can be placed in two classes—those which contain a complete system of ferments which cause *post-mortem* changes in flavour and colour, such as the apple, pear, cherry, peach, strawberry, banana, and grape; and a second class which lack such ferments, and consequently undergo no such discoloration, such as orange, lemon, raspberry, black currant, gooseberry, and tomato. The latter class could be successfully preserved in air for several months by freezing, while the former class could not be kept successfully in air owing to the disagreeable flavours and changes in colour which the enzymes caused, but if kept in the frozen condition in an atmosphere free from oxygen—for instance, nitrogen—the normal flavour and colour were retained. Investigations of this kind are of real service, for their practical outcome may be to increase the popularity of fruit as an article of diet.

THE ninth Norman Kerr Memorial Lecture will be delivered before the Society for the Study of Inebriety by Sir Arthur Newsholme, K.C.B., M.D., F.R.C.P., late Principal Medical Officer to the Local Government Board, on Tuesday, October 11th, at 5.30 p.m., in the Barnes' Hall of the Royal Society of Medicine, 1, Wimpole Street, W.1. The subject is, "Some International Aspects of Alcoholism, with Special Reference to Prohibition in America."

[1] H.M. Stationery Office. London, 1921. Price 1s. net.

Scotland.

The British Association in Edinburgh.

By Thursday, September 8th, all the thirteen sections into which the British Association has been divided were actively engaged in the discussion of the various subjects set forth in the programme. In several of these sections matters interesting to the medical profession were dealt with. In the Chemistry Section, for instance, the President, Dr. M. O. Forster, F.R.S., gave an address on the laboratory of the living organism, in which he drew a fascinating picture of the processes going on in one's body at breakfast time, from the first preliminary appetizing sniff of the sizzling bacon, through all the following specific actions up to satisfaction; breakfast ought not to be a hurried compromise between hunger and the newspaper. He touched also on malt liquors, and suggested that if children were encouraged to cherish the same intelligent sympathy with yeast cells which they so willingly displayed towards domestic animals and silkworms, perhaps there would be fewer crazy dervishes to deny us the moderate use of honest malt liquors and unsophisticated wines, fewer pitiable maniacs to complicate our social problems by habitual excess. In the Zoology Section Professor E. S. Goodrich dealt with some problems in evolution, and pointed out that it could not be maintained that whilst old-established characters were inherited, newly-begotten ones were not, or were less constant in their reappearance. By experimental breeding it had been shown that the newest characters might be inherited as constantly as the most ancient, provided they were possessed by both parents. But it had also been shown that the green colour of chlorophyll—a very old character in plants—could be abolished by cutting off the light from a germinating seed. A strongly hereditary character was the presence of the paired eyes of vertebrates, yet the addition of a little magnesium chloride to the sea water in which the eggs of Fundulus were developing would give rise to embryos with a median eye. For a character to reappear in the offspring it was essential that the germinal factors and the environmental conditions which co-operated in its formation in the ancestor should both be present. Factors might be transmitted, but characters, as such, never were. The characters of the adult, being responses, were not present as such in the fertilized ovum from which it developed; they were produced anew at every generation. Professor Goodrich referred to the experiments made by Professor Guyer of Wisconsin, in which an environmental stimulus had apparently given rise to a heritable mutation. By injecting a fowl repeatedly with the substance of the lens of the eye of a rabbit an antilens serum had been obtained; on injecting this sensitized serum into a pregnant female rabbit, while the mother's eyes remained apparently unaffected, some of her offspring developed defective lenses; on breeding the defective offspring for many generations these defects were found to be inherited; when a defective rabbit was crossed with a normal one the defect seemed to behave as a Mendelian recessive character, and the defect might be inherited through the male as well as through the female parent, and was therefore not due to the direct transmission of antilens from mother to embryo in utero. Professor J. Arthur Thomson discussed the problem of "modification species," and raised the question whether species makers had not from time to time been deceived into making species out of what were just nurtural effects; he illustrated his contention by the description of an antipatharian colony which had altered its ordinary mode of growth on account of the presence of a polychaet worm. Professor Cossar Ewart criticized the scale origin of feathers, and drew attention to the study of the nestling feathers (prepennae) which precede the true feathers (pennae). Sir Walter Morley Fletcher gave the presidential address in the Physiology Section; he dealt with the aims and boundaries of physiology, and pointed out how the war had brought to the front new problems in connexion with terror, physical damage, chemical attacks, and the strains of aviation—all in their effects upon the human body. Hormones and vitamins had to be carefully investigated. "The nation had seen a Minister fall whose control of the people's food was not based upon physiological law, and his successor gain renown whose adoption of the teaching of physiological experiment was early and faithful." Sir Edward Sharpey Schafer followed and emphasized the statement that histology must be treated as an integral part of physiology, and that physiology was an independent science and not merely a branch of medical science. Dr. H. S. Langfeld of Harvard (U.S.A.) gave the address on the study of personality in the Psychology Section; he believed that the Freudian psychology had contributed much to the study of character in that it had struck at the roots of the motives for our actions; the analysis and measurement of mental traits was a great problem for the present time. Dr. Langfeld described an experimental method by which it was possible to detect deception by means of the blood pressure.

On Friday, September 9th, Professor W. D. Halliburton spoke on the perennially attractive subject of giants, "feeble and usually short-lived persons," and he linked them up with the little pituitary body with its vast potentialities and great usefulness. In the joint meeting of the Geographical and Anthropological Sections Sir Arthur Keith opened a very interesting discussion on the origin of the Scottish people, dwelling on the obscure "harpoon folk"; Professor Bryce of Glasgow and Dr. J. F. Tocher also spoke. In the Psychology Section there were some outstandingly medical matters dealt with, such as consciousness and the unconscious, by Professor C. Lloyd Morgan, of Bristol; psycho-analysis and suggestion in shell shock, by Dr. W. Brown, London; and on forgetting, by Professor T. H. Pear, Manchester. Molecules and dye-stuffs interested the Chemistry Section; the origin of the bony vertebrates and the soil protozoa were discussed in the Zoology Section; and in the Physiology Section kidney deficiency tests, vitamins, and the pulmonary circulation under the influence of pituitary extracts engaged attention. All the sections continued their meetings on Monday and Tuesday, September 12th and 13th, and some went on till Wednesday, September 14th.

The Health of Glasgow in 1920–21.

The one hundred and forty pages in which Dr. A. Kerr Chalmers, the medical officer, has described the health conditions of Glasgow for 1920 are full of data of supreme importance for the student of the hygiene of great cities. Dealing as he does with a mass of human beings second only in size to London within the British Isles, Dr. Chalmers has to look at all his problems in the large. For instance, there is the size of the staff by whose means he carries on the work of safeguarding Glasgow, and the various subdivisions of the work into port local authority, bacteriological laboratory, fever hospitals, tuberculosis sanatoriums, child welfare, venereal diseases, tropical diseases, veterinary, housing, and many other departments; the large chart (opposite p. 18) which the report contains gives some idea of the magnitude and the ramifications of the organization which is controlled from the head office, with its secretary, general clerks, typists, and others to the number of 75, and its divisional staff of 256, not including the bacteriological and veterinary workers; but the work itself is not so to be represented, although the pages devoted to the special account of the small-pox outbreak, by Dr. A. S. M. Macgregor, give an inkling of the immense amount of activity which was called into being by this one feature in the epidemiology of 1920.

The Small-pox Epidemic.

For some fifteen years Glasgow, like Scotland generally, was remarkably free from small-pox; the years 1901 and 1904 had witnessed considerable outbreaks, but then a period of freedom had come, to be broken in March, 1920, when two small groups of cases occurred, traceable in one instance to a ship which had arrived from Bombay. At that time, as Dr. Chalmers points out, two new factors had to be taken into account in the city conditions; one was the presence of a large number of unvaccinated children in the population who would act as danger points, and the other was the return to civil life of many adults who had been revaccinated while on war service, and who would therefore act, so to say, as non-conductors of infection. With regard to the former factor, there was immediate evidence of its influence in the occurrence of small-pox among the unvaccinated according to age; of the unvaccinated who were attacked with the disease 87.8 per cent. were under 15 years of age, and only 12.2 per cent. above it. The percentages in the 1901 outbreak were 65 and 34

respectively. Of course, with the first signs of the outbreak in 1920 vaccination and revaccination were offered freely, and some 225,000 persons responded; to these Dr. Macgregor adds 100,000 ex-service men who had been recently revaccinated, and about 124,000 children who had been born and vaccinated within ten years. In this way a total of 449,000 protected persons had been built up by the end of the outbreak out of a population of 1,115,000; so that considerably less than half the people of Glasgow had been vaccinated and revaccinated. No wonder that the opinion is expressed that "this proportion of recently vaccinated persons is insufficient to protect the city against a possible further severe outbreak." In an addendum Dr. Macgregor brings the results up to the close of March, 1921: of the vaccinated attacked by small-pox, there were 429, of whom 69 died (a mortality of 16.1 per cent.); of the unvaccinated attacked, there were 128, of whom 47 died (a mortality of 36.7 per cent.); and of those doubtfully vaccinated there were 21, of whom 9 died (a mortality of 42.9 per cent.). If the cases be divided into those under and those above 15 years of age, a marked contrast is discovered between the vaccinated and the unvaccinated; there were 30 vaccinated cases under 15 years, with no deaths, as against 112 unvaccinated cases, with 38 deaths; there were 399 vaccinated cases over 15 years, with 69 deaths, as against 16 unvaccinated cases over 15 years, with 9 deaths. The whole of Dr. Macgregor's special report is worthy of close study, and what he has to say regarding the notification of chicken-pox and missed infections is peculiarly interesting. The "missed" cases arose in various ways: some of them were instances of so virulent a form of small-pox that death occurred before the distinctive signs appeared, and the deaths were entered as uraemia, malignant scarlet fever, and miliary tuberculosis, etc.; others were examples of the very mild form of the disease, the individuals moving about freely among the population unsuspected until more severe cases arose from them and were traced back to them.

Venereal Diseases.

Another interesting portion of the report deals with the scheme which is being worked in Glasgow to counteract the venereal diseases. The most gratifying feature of the year's record was the improvement in the proportion of attendances to new cases treated outdoor: in 1919, 4,976 out-patients made 50,452 attendances, or an average of 10 attendances each patient; in 1920 the corresponding average was 14; but from many indications it can be seen that the medical officer of health is not easy in his mind about the future, and is far from satisfied with the means at his disposal for fighting this dread scourge of modern life. He says it is a common observation that few patients will attend clinics until they become non-infective, but cease to come as soon as pain or discomfort is lessened; and he adds:

"As such persons may become active spreaders of the disease legislation has been suggested with the object of penalizing such action when established. It is possible that these proposals are based on too hopeful a view of the willingness of patients to comply with restrictive legislation, and at present there is no way of applying the preventive provisions of the Public Health Act to venereal diseases save by first making them notifiable. The notification of primary syphilis would be a practicable proposal, because the disease can be treated to a non-infective stage, but gonorrhoea, from the difficulty of establishing a non-infective condition, would present much the same administrative problem as does pulmonary phthisis. A beginning would be made, however, were there power to insist that either or both of the parents of a child suffering from gonorrhoeal ophthalmia neonatorum should place themselves under treatment."

Dr. Chalmers, too, is not happy about ablution centres, and he asks whether we can, with any hope of being listened to, appeal to the honour of youth to keep itself chaste by avoiding occasions of infection, and then tell the young man that he may make a safe exchange with chastity at the nearest ablution centre. A formulated public opinion is certainly greatly to be desired.

Births and Deaths.

The number of births which took place in Glasgow during 1920 was 32,992, the highest recorded in the present city, nearly 7,000 in excess of 1919, and giving a rate equal to 29.26 per 1,000, as compared with one of 23.18 per 1,000 in 1919. This rate should presumably be a little higher, as the population of Glasgow has been found by the Census to be somewhat less than was estimated. The marriage rate, which is often associated with the birth rate, was 9.8 per 1,000 in 1914, 10.3 in 1915, 8.6 in 1916, 8.3 in 1917, 9.4 in 1918, and 9.0 in 1919; it rose to 12.4 in 1920. The deaths in Glasgow (after correction for institutions, etc.) numbered 16,765, as against 18,237 in 1919; this gives a death rate of 15.3, exactly the same as that in Dundee, but higher than Edinburgh (13.3), London (12.6), and Manchester (13.4), and lower than Liverpool (16.0). The infantile mortality was 106 per 1,000 live births, as compared with 114 in 1919; but the greater fatality of this first year of life in the case of illegitimate as contrasted with legitimate children is shown more clearly than ever in 1920, the rate among the illegitimate being 181, and among the legitimate 101. In this relation the pages devoted to the extensive and intensive maternity and child welfare work are well worth careful study; much is being done in preparing a better soil, and the medical officer of health may really believe that some fruit is already being gathered.

THE SANITARY ASSOCIATION OF SCOTLAND.

The forty-seventh annual congress of the Incorporated Sanitary Association of Scotland was held in Dundee from September 7th to 10th. At the annual business meeting Dr. G. Clark Trotter, Medical Officer of Health, Deptford, London, was elected President, and Mr. Thomas Bishop, Deputy Chief Sanitary Inspector, Edinburgh, and Dr. Matheson Cullen, Scottish Board of Health, Edinburgh, Vice-Presidents. Major W. S. Patton, M.B., formerly Director of the Pasteur Institute of Southern India, and now lecturer on medical entomology in Edinburgh University, delivered a popular lecture on mosquitos and disease. On Thursday morning the President (Dr. Clark Trotter) delivered an address on home environment and a sanitary conscience in relation to public health, in which he emphasized the value of home visitation, home instruction, and direct personal hygienic teaching in the progress of public health; he drew striking instances from Salford and Paisley (where he was medical officer of health) in confirmation of this statement, for in these places there had been voluntary and official home visitation, with a remarkable fall in the infantile mortality rate in both cases. Housing had to be attended to. Whilst he spoke of the great value of official child welfare work, he deplored the passing of the family doctor in the old sense. Mr. Robert Mitchell, Chief Sanitary Inspector, Dundee, raised the question, To what extent is the Rats and Mice Destruction (Scotland) Act likely to be effective? The Act was an aftermath of the war, and Mr. Mitchell thought it had serious defects. For instance, the onus of extermination was laid upon the occupier of premises and not upon the owner; yet infestation was usually the result of structural defects for which the owner was responsible. There would require to be co-operation between owner, occupier, and officials if the Act were to be a success. It was calculated that there were 41,000,000 rats in the country, or one for each head of the population, and that one rat could destroy at the rate of £1 per annum. Gassing was the best method of destruction, for it killed not only the full grown but the newly born rats in the nest. Mr. Peter Fyfe, Director of Housing, Glasgow, dealt with construction and reconstruction in housing. He held that those who opposed the continuance of the State subsidy were playing into the hands of communistic agitators. To economize on housing in the present appalling state of matters was a blunder of the first magnitude. Ex-Provost Raffan read for Dr. A. J. Wilson, Medical Officer of Health, Airdrie, a paper on lessons of the great war on the control of infectious disease, with as a text "The bacillus kills more than the bullet." Speaking of small-pox, Dr. Wilson said we had escaped a pandemic of that disease such as followed the war of 1870–71 largely because nearly all the troops engaged in the recent war had been protected by previous vaccination. Disinfection on the largest possible scale, and in the shortest possible time, was the principle of primary importance against lice-borne diseases. Mr. Allan W. Ritchie, Chief Sanitary Inspector, Edinburgh, spoke on the dangers of dirt and vermin under the heading of cleansing of persons and houses. On September 9th the chief subject discussed

was Dr. G. Arbuckle Brown's paper on the sanitary construction of schools, in which emphasis was laid on the provision of cloak-rooms for the prevention of pediculosis, on lavatories, and on the abolition of common drinking cups in connexion with fountains. Lieut.-Colonel Gerald Leighton, M.D., contributed a paper on the standardization of meat inspection; Dr. G. Matheson Cullen introduced a discussion on factors making for increased efficiency in industrial life; and Dr. J. F. Tocher, county analyst, Aberdeenshire, spoke on the need for consolidating the law relating to the sale of food and drugs. A resolution was passed calling upon the Scottish Board of Health and the Government to take action which would enable the authorities to deal in a compulsory manner with persons and houses in a verminous condition.

England and Wales.

Memorial to Dr. R. W. Michell of Cambridge.

It has been suggested by many of his old friends that some form of permanent memorial should be instituted at Cambridge in memory of the late Dr. Robert Williams Michell, who lost his life during the war as a result of wounds received whilst rescuing wounded from "No Man's Land" on the Somme. An obituary notice, with an appreciation by Sir Clifford Allbutt, was printed in the JOURNAL of July 29th, 1916. A sum of money has already been guaranteed for the purpose of a memorial to one who will long be remembered for his unfailing qualities as a personal friend and adviser, as well as for his unselfish interest and assistance in connexion with Cambridge rowing. Further, in the words of the Regius Professor, "Michell was an example of a man in busy general practice who transacted it all in the spirit, method, and assiduity of science." It is proposed that the memorial should take the form of a challenge cup, known as the Michell Cup, to be awarded every year to the college boat club gaining most marks under a scheme that has been drawn up. The suggestion is that subscriptions be limited to £2 2s., which should be sent to Dr. C. H. S. Taylor, 3, Trinity Street, Cambridge.

Infant Welfare in Manchester and District.

The Manchester and Salford Council of Social Service has recently been investigating the extent to which official and voluntary organizations in Manchester and Salford were fulfilling their statutory obligations, and were availing themselves of the permissive powers given to them in recent public health legislation. A report by that Council gives the results of this investigation, although a great part of it has been sterilized by the financial difficulties that have stopped so many of the promising schemes of the late Minister of Health. The reporting committee decided that it would be misleading to issue a report based on hopeful expectations which were to be no longer entertained; it seemed that in only one material respect were things better than in 1914, the war having caused the public to appreciate the danger of producing physical inefficients in discreditably large numbers. To ensure that infant life should be normal in an industrial environment minimum standards of space, comfort and sanitation must be enforced in all dwelling-houses, with a maximum standard per acre of population and a maximum standard of smoke in inhabited areas. The birth and nurture of children in infancy is a natural function, which in normal conditions requires no special training, and in many industrial areas real progress can only be made when sustained and determined effort has gradually brought conditions back to the normal. It is suggested in the report that girl children at school should be specially trained in the functions and duties of motherhood in order to overcome the abnormal conditions in industrial districts, but the whole subject must be simplified and set out in plain language before the great mass of fathers and mothers who have the voting power which constitutes political pressure. The report contains many other points of interest, including a section on camps as an adjunct to city life, and an appendix on the permissive powers and statutory orders of local authorities.

Australia.

Director-General of the Australian Army Medical Services.

Major-General Sir Neville R. Howse, V.C., K.C.B., F.R.C.S.Eng., has been appointed Director-General of the Australian Army Medical Services. The appointment is for five years at a salary of £1,500 per annum. Sir Neville Howse distinguished himself in the Boer war as a lieutenant in the New South Wales Lancers, and for his bravery at Vredsfort was awarded the Victoria Cross. He was soon afterwards placed in charge of a field ambulance and promoted to the rank of major. In 1914, at the outbreak of the great war, he went to New Guinea as principal medical officer of the Australian forces, and having completed his work there he left with the first Australian Division for Egypt. He was subsequently appointed Assistant Director of Medical Services of the division, and superintended the removal of the wounded in the Gallipoli landing. For his conspicuous services in this work he was created a C.B. In 1916 he became Director-General of Medical Services of the A.I.F.; he received the K.C.B. in the following year.

Military Hospitals.

The A.I.F. ceased to exist on April 1st last, and since then the Repatriation Department has been responsible for all the patients in the military hospitals. The Repatriation Commission arranged to take over the entire administration of the hospitals formerly conducted by the Defence Department in Brisbane, Adelaide, Perth, and Hobart. By mutual arrangement the Defence Department continued the conduct of the hospitals at Caulfield in Victoria, and at Randwick in New South Wales, for the treatment of repatriation cases in these respective States, the Repatriation Commission providing the funds to meet all necessary expenditure. It has now been decided, however, that the Repatriation Commission shall from July 1st assume the entire control of these institutions, and thus establish a uniform system of civilian hospital provision for military patients throughout the Commonwealth.

Sydney University.

Owing to the increases in the personnel and the salaries of the teaching staff of the Sydney University the Senate has decided to approach the Government for an increased grant of £15,000 per annum. This is required to meet the increased cost of chemicals and apparatus, as well as the increases in wages and salaries. The Senate states that the amount of compensation to be given to the university on account of the free attendance of public exhibitioners was fixed at £20,000 per annum in 1913. Since then the increase in the prices of all materials has been so great that in some instances the cost is more than double the pre-war price. To meet this increase the Senate has already found it necessary to raise the fees of paying students by 50 per cent. The exhibitions referred to are allotted on the basis of a percentage of the population, and have now reached 200 annually. These students enter the university for a course of at least four years, and this is equivalent to £200.

Considerable difference of opinion has for some time existed in regard to the method of making appointments to the university staff. Professor MacCallum urged that when vacancies on the teaching staff occur or when new lectureships or professorships are established a committee should be appointed to consider and report to the Senate in each particular case whether it is most advisable to proceed (1) by making inquiries among recognized authorities with a view to inviting an application, or (2) by promotion, or (3) by advertisement. The Senate, however, decided that in future the permanent posts on the teaching staff shall be filled by election after applications have been invited by advertisement, unless the Senate resolve, upon a report of a committee of inquiry, that a proposed teacher is of such acknowledged reputation in the subject to be taught that no one else of equal eminence is likely to apply.

Radium for the Royal Prince Alfred Hospital.

In 1918 a parcel of radium valued at £1,000 was presented by Sir (then Mr.) Hugh Dixson, the condition of the gift being that during the war the radium was to be

in the possession of the Royal Prince Alfred Hospital for purposes of medical research and application, and that as soon after as was possible the chancellor of the university and the chairman of the board of directors of the hospital should meet and agree whether its use in medical or physical science would be for the greater benefit to society generally. If they decided in favour of physical research, the radium was to become the property of the Sydney University absolutely. If medical science should have the preference, the radium was to be in the possession of the Royal Prince Alfred Hospital for a period of five years, when a similar meeting would decide the question for a further period. A meeting of the two officials was held recently, and it was decided that the radium should remain in the possession of the hospital for the next five years.

Maimed Soldiers.

An effort is now being made to provide a hostel for maimed and limbless soldiers in New South Wales. Attention has been directed to the large number of these unfortunate men who are seen begging in the city streets, and it is felt that some home should be provided for those who are unmarried or unattached which they could make their headquarters, and from which an effort might be made to establish them in some business. The Red Cross has already taken the initiative in establishing a pottery business, and a number of men who have suffered double amputations are accommodated at the Red Cross Home known as Rose Hall, in Sydney, where they are supplied with wheel chairs and motor cycles. About 1,000 men have returned to New South Wales more or less maimed, and a large number of them have already secured employment through the Limbless and Maimed Soldiers' Association, but it is desired that some provision should be made for rendering assistance to any of these soldiers who may requre it at any time. At a meeting recently held at Government House an interesting account of the work already being done for these men was given by Colonel Moseley and Mr. Owen of the Limbless and Maimed Soldiers' Association. It was stated that there is about £600 in hand for the building, and various schemes for raising further funds are being considered.

Correspondence.

LONDON PROVIDENT HOSPITAL SCHEME.

SIR,—It will doubtless be within the knowledge of your readers that certain of the large London hospitals have decided to offer their services to members of the National Provident Scheme for Hospital and Additional Medical Services. We are now in a position to announce that the National Provident Scheme will definitely come into operation in London on November 1st next. To those who are considering its adoption in other areas we have offered all the help and advice we can give, as we are assured that wherever the scheme attracts a sufficient membership the financial anxiety of the hospitals will be steadily lessened.

The scheme offers to those who come within certain prescribed limits of income, as well as to all those who are insured under the National Insurance Acts, practically all the higher resources of medicine free of charge beyond the payment of their annual subscriptions, and its advantages to the community are self-evident. But there is a larger issue at stake. Men and women who are in receipt of small but regular incomes can by joining the Provident Scheme provide, during health, for the irregular and critical expense of illness. These persons do not ask for charity, and are not fit subjects for it, but when they are ill their income stops, and they cannot afford the heavy costs of medical treatment outside the hospitals. They have consequently been forced hitherto to accept, in whole or in part, treatment provided by charity for the sick poor, or, alternatively, to go without.

The voluntary hospitals are now asking their patients to contribute towards their cost to the hospital, and members of the Provident Scheme will not only escape this inconvenient call upon them in illness, but have the satisfaction of knowing that they are paying their way, and that they will be helping the governing bodies of the several voluntary hospitals to maintain the high traditions and advantages of the voluntary system of hospital administration of which the nation is so justly proud.

The hospitals and other bodies co-operating in the scheme in London can supply to a limited number of members all the services promised, but as the success of the scheme will depend upon the satisfaction of its members, and as it is essential that the hospital and other medical and surgical benefits should be rendered promptly to members who require them, we have decided to limit strictly the number of members. Applications from those wishing to join the scheme will be dealt with in the order in which they are received until it is necessary to close the list.

We believe that the public are determined to save the voluntary system, and for this reason we launch the Provident Scheme in London with every confidence that it will be welcomed, and that its extension to other parts of the country is only a matter of time.—We are, etc.,

ARTHUR STANLEY,
DAWSON,
ALAN G. ANDERSON,
W. MCADAM ECCLES,
J. F. GORDON DILL,
Organizing and Executive Committee of the National Provident Scheme.

3, Fenchurch Avenue, London, E.C.3,
Sept. 7th.

*** As stated in our last issue, an explanatory leaflet, giving particulars of the scheme in London, may be obtained from the Honorary Secretary, 77, Cambridge Terrace, Paddington, W.2. This shows that the facilities will include arrangements for consultation, nursing, dental services, laboratory and *x*-ray examination, massage, electrical and radium treatment, hospital treatment, and ambulance transport.

VITAMINS AND DEFICIENCY DISEASES.

SIR,—Beri-beri is called a disease of deficiency, and so it is; but it might be called as truly a disease of excess. The vitamin B is not essential to health. Men can live in perfect vigour wholly on flesh, fruit, and vegetables—all B negative; but they dare not add to that dietary a daily ration of 1 lb. white bread or white rice without great danger of beri-beri, and the risk is the greater when work and hunger force the body to attempt to utilize what might otherwise be allowed to pass through. The disintegration of food during digestion and the reassembling of the molecules for assimilation is a complicated process, and it seems evident that the vitamin B is essential for the proper assimilation of grain; without it I believe a toxin is liable to be formed in the intestinal wall which causes the beri-beri symptoms. If the toxin be denied, the only alternative is that a chemical constituent of the nervous system is withdrawn to secure the assimilation of the decorticated cereals, and the nerves thus left defenceless. I think it was Dana who described the redskin's feast of grass seeds; but primitive man discovered the advantage of cultivating grain to furnish a wholesome satisfying food which could be stored without putrefaction; it was left to modern man to perfect the decortication and find it deleterious.

The vitamins are synthetized by plants for their own purposes, and water-soluble C is certainly No. 1. B or No. 2 is an allotropic form more stable and resistant, invented by plants as they spread to new lands where continuous growth was impossible owing to a cold or dry season. Stored up in the seed, on the advent of suitable conditions it is reconverted into C (No. 1) and germination and growth proceed. The vitality of seeds varies immensely, depending apparently on the amount of B and the protectiveness of the husk or shell. It is noteworthy that the subtropical Citrus family, famed for the amount of C in the mesocarp, cannot store it, and the seeds die on drying in the course of a few hours. None of the vertebrates can synthetize the vitamins or transmute one sort into another, but they can store up uncertain quantities of them. The herbivora take the vitamins directly from the plants, and the carnivora obtain all they need of C and A from what is stored in their prey. So we may take it that the A of cod-liver oil is derived from plankton through innumerable hosts, and that the quantity so obtained is far beyond the requirements of the cod in adult life. The

quantity necessary of any vitamin seems to be small. It was found in Mesopotamia (BRITISH MEDICAL JOURNAL, January 17th, 1920) that 2 oz. oatmeal gave enough B to safeguard the oatmeal and a daily ration of 1 lb. white bread which had previously been causing beri-beri; and the milk of the lioness contains enough C to make orange juice unnecessary.

I have seen a lot of scurvy in the last two years, and here too I cannot avoid belief in a toxin of excess. No one calls rheumatism a disease of deficiency; it seems here rather a disease of excess (the everlasting sour gruel and sour milk), and the two diseases have common symptoms. I have seen cases with disabling rheumatoid pain in legs and arms yet with only the faintest sign of scurvy in the gums. (The brawny swelling of the shins is not a feature of this type.) From the scurvy point of view all foods may be classed as living or dead. Vegetables, fruit, flesh, milk, are living till killed by overcooking or decomposition, and grain is dead unless malted. If the natives get nothing but sour gruel made from finely-ground maize day after day, the original store of vitimin C is exhausted before long, and all the sooner if the store was small through the previous home-feeding being deficient in C in times of drought. That a small amount of living food with C is necessary for the assimilation of dead food is clear, but the relationship is not so evident as in the case of grain feeding.

Milner Fothergill of old advised exercise for diabetics so that some of the sugar should be used up in the muscles. Is not diabetic gangrene a sign of intoxication of the tissues by excess? A recent correspondent urged excess of starches as the cause of rickets; and I can well believe it when the age of infants or confinement of puppies prevents the excess being worked off, as Fothergill advised with regard to sugar. If so, this again is no deficiency but a toxin from excess.—I am, etc.,

Mqanduli, S. Africa, July 7th. P. H. WALKER.

RETROGRADE CATHETERIZATION FOR STRICTURE.

SIR,—I was interested to read Mr. W. J. Foster's article on "Retrograde catheterization for impermeable stricture of the urethra," in your issue of June 25th, p. 931, but the device is well known to surgeons in Nigeria, and probably other tropical countries where impassable strictures, accompanied by urinary fistulae in the perineum and scrotum, are so common.

It must be a rare event that either an external urethrotomy or a retrograde catheterization is required in those strictures that are unaccompanied by urinary sinuses, for it is almost always possible to dilate such strictures in the ordinary manner or perform an internal urethrotomy. Even in cases with retention of urine, if the bladder is drained suprapubically through the puncturing trocar, within a few days' time it will usually be found possible to pass a fine guide under an anaesthetic (with or without the aid of a urethroscope), and subsequently larger sounds or the internal urethrotome. I have therefore not performed retrograde catheterization as a help to dilatation of a stricture, but only as an aid in finding the bladder end of the urethra in the perineum in the performance of Wheelhouse's external urethrotomy, when a stricture has been accompanied by urinary sinuses.

In tropical countries strictures with urinary fistulae are frequently so neglected that when the cases present themselves for operation to the surgeon the perineum often consists of a mass of inflammatory and scar tissue almost cartilaginous in texture, and unless a fine whalebone guide can be passed down the urethra into the bladder it is impossible, in many instances, to find by dissection in the perineum the vesical portion of the urethra beyond the stricture.

As a matter of fact, of late years in this hospital in Calabar I have made it my practice to start a Wheelhouse's operation with an extraperitoneal suprapubic cystotomy and perform retrograde catheterization in all instances where no guide, however fine, can be passed into the bladder. It ensures the certainty of finding the urethra, frequently saves a tedious and perhaps futile dissection, and the combined operation can be completed in half to three-quarters of an hour. The bladder and abdominal walls are sewn up after the operation and a No. 10 silver catheter tied into the bladder through the urethra for three days, and subsequently soft rubber catheters tied in until a week has expired. I leave no drainage tube in the bladder, and seldom one in the abdominal wall down to the bladder.

Of course external urethrotomies are far more commonly performed in the tropics than at home; indeed, they form a large section of a surgeon's operative work out here.

I extract the following paragraph from the scientific section which I wrote for the *Calabar Annual Medical Report* in 1917, which may be of interest:

"*Retrograde Catheterization of Urethra from Bladder during the Operation of External Urethrotomy.*—This device is not unknown to surgeons in West Africa, for it has been carried out on several occasions. In countries where skilled medical aid is not available, the tissues around those strictures of the male urethra which are associated with urinary sinuses have often progressed to such advanced state of chronic fibrotic inflammation that it is impossible to find the bladder end of the urethra from an incision made in the almost cartilaginous mass of scar tissue of which the perineum then consists. The penile end of the urethra having been found in the perineum by the aid of the metal staff passed in the usual direction, the distal end is found by opening the bladder extraperitoneally above the pubes and catheterizing it from this end towards the perineum. It is not always easy, however, to find the vesical end of the urethra, and much time may be wasted in attempting to do so. Should any difficulty arise the following manœuvre should be carried out: A pair of tenaculum forceps are passed into the bladder and fixed on to the inner coats of its wall in a spot behind the trigone. The bladder is then lifted up, when it will be found that it is so loosely attached to surrounding structures that it may be turned almost inside out, so that the vesical urethral opening comes readily into view and may be catheterized easily. It is because I have not heard of this device being performed before that I have reported the matter here."

I am certainly not the first surgeon to institute retrograde catheterization in Nigeria. I believe Dr. George Munn Gray, of Lagos, and probably other surgeons, practised the combined operation before myself.—I am, etc.,

E. E. MAPLES, M.D.Lond., F.R.C.S.Eng.,
Senior Medical Officer, W.A.M.S.
Native Hospital, Calabar, Southern Nigeria,
Aug. 5th.

VACCINE THERAPY AND CYSTITIS.

SIR,—I should like to endorse Dr. Knyvett Gordon's remarks upon this subject. Like Dr. Gordon, I am most sceptical about the results of vaccine therapy in infections of the urinary tract, because only a small percentage of these infections are suitable for vaccine treatment alone, though in suitable cases, and as an adjunct to surgical and other treatment, vaccines are extremely effective. Like Dr. Gordon, I repeatedly receive specimens of urine with such inquiries as, "Is there a germ present? If so will a vaccine do any good?" My reply is, "The germ present is so-and-so; as to whether a vaccine will be of any benefit or not depends entirely upon the clinical condition."

While the prevailing view-points exist—namely, that all vaccines are the same no matter by whom prepared, and that a sign or symptom indicates some particular disease—the present unsatisfactory results will continue.

Mr. Dobson states that "inaccurate diagnosis is at the root of the present unsatisfactory position as regards the treatment of urinary infections." The failure of many forms of treatment is explained by this fact, as the particular treatment used was never meant for the actual disease existing. Mr. Dobson, however, sweepingly condemns vaccine therapy, though admittedly carried out under these conditions.

It is not a sceptical bacteriologist that is required, but one with a sound clinical knowledge, to help to diagnose the exact condition and to advise how much or how little effect a vaccine is going to produce, and what other concomitant treatment it is necessary to carry out. In my own experience I know that vaccines have been given for such conditions as nephroptosis, tuberculous kidney, stone in the ureter, etc., and vaccine therapy in urinary infections condemned as a result.

The essential factors in vaccine therapy are: (1) Accurate clinical diagnosis; (2) determination of what surgical or dental concomitant treatment must be carried out; (3) expert experience in obtaining the essential organism. Other important factors are (4) the actual technique used in preparing the vaccine, and (5) regulation of dose and

interval according to clinical indications. As the end results of an operation depend upon the accuracy of diagnosis, judgement, and operative ability of the surgeon, so the end results of a vaccine depend upon the same attributes in the bacteriologist.

I find that these attributes are recognized by the public, though a large proportion of the profession are apparently oblivious to them. When a patient is cured—say, of rheumatoid arthritis—after he has been unsuccessfully treated by other bacteriologists, he will make the remark that "a good deal seems to depend upon who makes these vaccines." The end result upon which the patient gauges the value of the vaccine is dependent upon the attributes of the bacteriologist as mentioned.

In conclusion, I would point out that the effects produced by vaccines follow a definite scientific law, with definite limitations and indications. Vaccines can take a most important part in the treatment of urinary infections, as in infections elsewhere. The maximum benefit can only be obtained by the close collaboration of the surgeon or physician with the clinical bacteriologist, and it is upon those lines that vaccine therapy will develop. No advancement is likely to occur from the indiscriminate administration of emulsions of bacteria.—I am, etc.,

S. G. BILLINGTON, M.B., F.R.C.S.

Wolverhampton, Sept. 10th.

TREATMENT OF EMPYEMA.

SIR,—I have read with great interest in to-day's issue of the BRITISH MEDICAL JOURNAL the discussion in Newcastle on the treatment of acute pleural empyema. On May 29th, 1920, you published my paper on "The immediate closure of empyemata," which I am justified in saying was original, and that I was the pioneer in this treatment of empyema.

I pointed out how unsatisfactory the old treatment of empyema was, and advocated in that paper the following important points:

1. An incision sufficiently large to introduce the whole hand into the pleural cavity in order to free all adhesions and remove all fibrinous clots.
2. Washing out the pleural cavity with a non-irritating antiseptic, such as flavine.
3. Filling the pleura with either flavine or 2 per cent. of iodoform in sterile paraffin.
4. Immediate closure of the wound to prevent a "sucking wound." It stands to reason that if a drainage tube is used the atmospheric pressure in the pleura is greater than in the lung itself, and the lung does not expand again as it should do.
5. A most important point, which has been overlooked by all the speakers: the daily evacuation of the retained fluid by the painless insertion of an aspirating needle between the edges of the wound. As the lung re-expands, it gradually pushes out the retained fluid which bulges under the skin.
6. An immediate bacteriological examination of the pus in the empyema is essential, as is also the daily evacuated mixture of iodoform and paraffin and pus taken out by the syringe.

I see no reason why a pneumococcal infection of the pleura should not be treated on the same lines as a tuberculous one, and surely there is just as much danger of secondary infection.

The two important points, therefore, in favour of the immediate closure of empyemata are the early re-expansion of lung and abolishing the danger of secondary infection.

I do hope that other surgeons who have more material than I have to work upon will read my paper, follow my technique, and publish their results. My results have been very satisfactory, and I am quite sure we are working on the right lines when we do away with a drainage tube. The day has come when we must realize that there is such a thing as "the abuse of drainage tubes."

In reading Mr. Wade's paper—on which I very sincerely congratulate him—and the discussion which followed, I see no mention of the name of the man who really revolutionized modern surgery by his work in France. I refer to my consulting surgeon in the 3rd Army in France—Sir Henry Gray of Aberdeen. It was he who first advocated excision and primary suture of wounds, immediate closure of the abdomen, the cranial cavity, and the knee-joint for gunshot wounds, and the operative treatment of penetrating gunshot wounds of the chest. As I have said elsewhere, it is the application of his methods to civil surgery which inspired me to work on the abuse of drainage tubes[1] and the immediate closure of empyemata.[2]—I am, etc.,

Windsor, Sept. 10th. FRANK HATHAWAY, M.D.

ASYLUM ADMINISTRATION.

SIR,—It was with very great satisfaction that I read your interesting review in the BRITISH MEDICAL JOURNAL of August 20th on Dr. Lomax's book entitled *The Experiences of an Asylum Doctor*, and also the articles in several lay newspapers, and I must say that I largely agree with most of the statements and opinions expressed therein.

I have had very considerable experience of medical and administrative work in British asylums, and also of the treatment of insane and of borderland cases, both inside and outside of such institutions. My official knowledge was principally acquired during a number of years of service in four large asylums as an assistant medical officer. For several years I had the privilege of being deputy superintendent of two large asylums in southern counties, where, like all other members of the staff, I received much kindness and consideration from the authorities.

In all the places where I did duty the patients were humanely cared for, but I am strongly of opinion that more should be done for their mental well-being and happiness. Earlier and more sympathetic treatment is necessary. As one correspondent states, that is left too much to chance, which is not just the method adopted in modern medical practice in dealing with other forms of illness or disorder.

The subject most urgently demands thorough public investigation by independent medical and lay experts, and great revisions and alterations are necessary. These will, I fear, increase the cost of treatment, but they will pay the nation abundantly: first, in fewer cases having to go to asylums; and secondly, for those whose mental state requires institutional care, in providing (*a*) a happier time during their detention, (*b*) a higher proportion of recoveries, and (*c*) better results in those who are discharged.

Perhaps I should explain that I am willing to express my opinions on the subject because I am in an independent position. I sincerely trust that the present treatment of the insane will be carefully and impartially investigated in the light of modern scientific knowledge and recent psychological teaching, and that better methods will very soon be introduced into this important but backward branch of medicine.—I am, etc.,

Southsea, Aug. 29th. W. J. MACKEOWN, M.B., B.S., D.P.H.

TREATMENT OF ARTHRITIS.

SIR,—I have read with much interest Sir William Willcox's article in the BRITISH MEDICAL JOURNAL of June 4th, 1921. I am glad to see that he sides so strongly with the authorities on arthritis who believe in infection as opposed to uric acid. I think it is greatly to be deplored that so many labels are used. In my opinion only one is necessary—acute or chronic cerebro-spinal toxaemia.

Amongst etiological factors he speaks of streptococcal or *Bacillus coli* infections as being prominent in most cases. Personally, I believe that in all cases there is an underlying germ such as that of measles, diphtheria, scarlet fever, tuberculosis, syphilis, typhoid, or malaria, at work; the streptococcus or *B. coli* being purely secondary and probably defensive rather than otherwise. One would imagine that such germs as I have mentioned readily leave the system if one accepted Sir W. Willcox's apparent view as expressed in the paragraph commencing "Arthritis from specific infections." What about carriers? Once such a germ enters the human system it never leaves. In my opinion there is no such thing as "non-specific infective arthritis." Streptococci, staphylococci, and the *B. coli* group are to my mind the refuge of the bacteriologically destitute. I most strongly take exception to the statement, "Disease of the nervous system is not associated with infective arthritis or the various forms of fibrositis." How does he explain such symptoms as mental depression, phobias, irritability, pain, insomnia, abnormal

[1] BRITISH MEDICAL JOURNAL, June 29th, 1918, p. 718.
[2] Ibid., May 29th, 1920, p. 734.

reflexes, spastic and wasted muscles, deflections and contractions of toes and fingers, and glossy, wasted skin?

I think he is wise in saying that cure can only be looked for in early, comparatively acute cases when vaccines are employed. Once the disease has reached the well-established chronic stage a prolonged, persistent course of treatment is required calling for accurate knowledge, skill, dogged perseverance and tact. On general principles the greater the experience of the practitioner in handling such cases the better it will be for the patient and his own reputation.

Finally his suggestions for treatment in chronic cases are of such an elaborate nature, and his subdivisions, such as panniculitis, are so numerous and bewildering that the whole is impractical to the general practitioner.

I personally pin my faith to continuous counter-irritation, which in skilled hands is efficacious in any form of arthritis or fibrositis.—I am, etc.,

Bournemouth, Aug. 21st. W. J. MIDELTON.

CHRONIC INFECTIONS AND MENTAL ACTIVITY.

SIR,—Mr. S. T. Irwin's presentation of a novel aspect of preventive medicine—his hint that the eradication of chronic infections may "result in the curtailment of human achievement and in the sacrifice of short-lived brilliancy to long-lived mediocrity"—makes a piquant essay. There is pathos in his picture of the race for a professional ideal, and the young "men of first-class ability, many of them consistently first of their year," dying by the wayside or doomed to finish their course at the walk; something pathetic, too, in his tale of that hospital staffed by promising men who, most of them, hold life by virtue of "a major operation." But once the thrill of its novelty passes, his idea fails to grip the imagination. The lack of a saving sense of humour becomes insistently apparent, and continued reflection provokes awkward thoughts—as that *Mens sana in corpore sano* offers, still, a hopefuller goal to humankind.

Apart from the toxin implication, Mr. Irwin's idea is not new. Back to the early days of the world you can trace it, and its prettiest expression is still the Grecian epigram, with its Roman echo, "Whom the gods love, die young." You may add, if you like, Wordsworth's complement, "They whose hearts are dry as summer dust burn to the socket." But, the words of Menander, Plautus, and Wordsworth notwithstanding, the notion is only in part true. Permit me to spill here, without sense or order, a few names whose owners were brilliant in or into middle age. The gods, we dare not doubt, loved Pasteur, Koch, Leonardo da Vinci; they loved Galileo, Hugh Miller, Tyndall, Darwin, Lamarck, Humboldt, Buffon, Harvey, Herbert Spencer, Lister, Walter Scott, Dickens, Thackeray, Meredith; and I am certain that, when they are not justly offended, they laugh with, and love, Bernard Shaw, whose "unbearable brilliancy" owes nothing to either toxins or alcohol.

Alcohol!—that suggests the other pretty conceit. At least I hope Mr. Irwin errs in his dictum, "Literature is full of examples of lucid exposition and extraordinary heights of eloquence resulting from the moderate drinking of alcohol." Psychologists insinuate that people most readily forget those facts which tend to refute their pet theories. There is a possible explanation of the mystery that, to me, literature appears rather deficient in such examples. Anyhow, try as I may, I cannot recall these numerous passages of exposition and eloquence. Memory rings with the rumour of fine things—always the tantalizing rumour—never the substance in black on white. So far as my knowledge goes, that is characteristic of alcohol.

But, rather than ask Mr. Irwin to accept my word for it, I shall quote the Great Cham of Literature. There was nothing bigoted or small about his views on alcohol—no Pussyfoot Johnson was Doctor Samuel—he knew (practically, too, if that be counted an advantage) what he was talking about. Yet Boswell commends, as "a very judicious practical advice," Dr. Johnson's warning that a man who has "been drinking wine at all freely, should never go into a new company. With those who have partaken wine with him, he may be pretty well in unison; but he will probably be offensive or appear ridiculous to other people." A critical reporter, you see, could not credit him with lucid exposition or eloquence, whatever rumour might say.

On the queston, "whether drinking improved conversation," the Doctor was equally emphatic:

> "No, Sir, before dinner men meet with great inequality of understanding; and those who are conscious of their inferiority have the modesty not to talk. When they have drunk wine, every man feels himself happy, and loses that modesty, and grows impudent and vociferous; but he is not improved; he is only not sensible of his defects."

When Sir Joshua Reynolds suggested "that moderate drinking makes people talk better," Johnson replied:

> "No, Sir; wine gives not light, gay, ideal hilarity; but tumultuous, noisy, clamorous merriment. I have heard none of those drunken—nay, drunken is a coarse word—none of those *vinous* flights. . . . I admit that the spirits are raised by drinking, as by the common participation of any pleasure: cock-fighting or bear-baiting will raise the spirits of a company, as drinking does, though surely they will not improve conversation. . . . I indeed allow that there have been a very few men of talents who were improved by drinking; but I maintain that I am right as to the effects of drinking in general." Later he added: "I do not say it is wrong to produce self-complacency by drinking; I only deny that it improves the mind."

Both in France and Germany literary men confronted with this question have denied that alcohol promotes either real eloquence or lucid exposition, and British scientists and authors have testified to the same effect. Quantity, then, rather than quality comes from alcohol; but only on a rigid quality basis can you reckon literature. The same argument should apply to the harvest from toxin activity if it be indeed, as Mr. Irwin conveys, "similar to that produced . . . by a glass of good champagne." There would appear to be little reason to expect "first-class ability" and men "consistently first of their year."

Hence alternative explanations are desirable. Is it not possible that chronic infections, impairing the capacity for and pleasure in strenuous outdoor sport, conduce to that prolonged study from which emerges the well-informed youth who captures the prizes of his year?—I am, etc.,

Belfast, Sept. 12th. ROBERT WATSON.

MEDICAL IMPRESSIONS OF THE MINERS' STRIKE.

SIR,—Allow me to thank your correspondents—whose contributions appeared in the issues of July 30th and August 13th—for their impressions in this matter.

Obviously statistics are beyond the reach of myself and of your other correspondents, and at best we can only record our individual experiences. But as our experiences appear to differ so widely, I am left with the hope that a way will be found of bringing the evidence furnished in the letters of "An Old Country Doctor" and of Mr. Walter Garman before the notice of the Commission to be appointed by the Minister of Health to investigate the workings of the Insurance Act, for it would appear to me that this Commission will be materially assisted in arriving at what should be a fair capitation fee per insured person payable to colliery medical practitioners. There does not appear to be any medical work required in co. Durham and Staffordshire in respect of the miner. But is it not the fact that some of the greatest opposition to the Insurance Act came from the North of England and Midland counties colliery practitioners, on the ground that their work under the Act would be increased and miserably underpaid? "Ils dansent sur un volcan!"—I am, etc.,

GENERAL PRACTITIONER.

IT is proposed to hold a large food exhibition at Olympia, London, in September, 1922. It will embrace raw materials and the preparation of food, and will include dairy produce, beverages, refrigerating plant, cooking utensils, and the construction of model factories.

THE National Housing and Town Planning Council has issued a printed memorandum on the present housing situation, containing suggestions for action by the housing committees of the local authorities; they include the steps to be taken to secure an extension of the period during which the housing subsidy shall be given, notes on the cost of building, and observations on the need for the maintenance of good standards of lay-out, construction, and design. These subjects will be discussed during the autumn at conferences arranged by the Council, as will also the steps which should be taken to arrange a future town planning policy.

Obituary.

SIR PETER FREYER, K.C.B., M.A., M.D., M.Ch.,

Surgeon to St. Peter's Hospital; Lieutenant-Colonel Bengal Army (ret.).

WE regret to announce that Colonel Sir Peter Johnston Freyer, K.C.B., Bengal Medical Service (retired), died at 27, Harley Street, London, on September 9th, aged 70. He was born on July 2nd, 1851, the son of the late Samuel Freyer of Ballynahinch, Galway, and educated at Erasmus Smith's College, Galway, Queen's College, Galway, Steevens's Hospital, Dublin, and Paris. He graduated as B.A. in 1872, and as M.D., M.Ch. in 1874, at the Queen's University, Ireland, in each case gaining first class honours and a gold medal; and in 1886 received the degree of M.A., *honoris causa*, from the Royal University, Ireland, which had by that time taken the place of the Queen's University. He entered the Indian Medical Service as surgeon on September 30th, 1875, passing first into the service, becoming surgeon-major and surgeon-lieutenant-colonel after twelve and twenty years' service respectively, and retiring on May 3rd, 1896. Nearly the whole of his service was spent in civil employment in the North-West Provinces, now the United Provinces of India, where he held the civil surgeoncies successively of Moradabad, Bareli, Allahabad, Masuri, and Benares, and was also for a short time surgeon on the staff of the Lieutenant-Governor.

After he retired from the I.M.S. he began a new career in England as a consulting surgeon in his special line, the surgery of the urinary organs, and in 1897 was appointed surgeon to St. Peter's Hospital for Stone, London, an appointment which he held till his death. When the recent great war started, in 1914, he rejoined for service as consulting surgeon to Queen Alexandra's Military Hospital, to the Indian hospitals in England, and to the Eastern Command in general. From April 10th, 1918, to April 10th, 1919, he held a temporary colonelcy in the R.A.M.C., and on resigning that post was promoted to an honorary full colonelcy on the retired list, and also received for his services the C.B. on January 1st, 1917, and the K.C.B. on June 4th, 1917. In 1894 he represented the Indian Government at the International Medical and Surgical Congress at Rome, and in 1904 received the Arnott memorial medal for original surgical work.

Throughout his career, while he was a first-rate general surgeon, his special bent was towards the surgery of the urinary organs. He was the first surgeon in India to bring into regular practice and to popularize Bigelow's operation of litholapaxy for stone in the bladder; and after his retirement from India he may be said to have originated—he certainly perfected and brought into common use—the operation of suprapubic prostatectomy, one of the great advances of modern surgery.

He was the author of several works on his own speciality: *Litholapaxy*, 1885, with enlarged editions in 1886 and 1896; *Stone in the Bladder*, 1900; *Stricture of the Urethra and Enlargement of the Prostate*, 1901, third edition 1906; *Surgical Diseases of the Urinary Organs*, 1908; and articles on diseases of the prostate and vesical calculus in Burghard's *Operative Surgery*, vol. iii, 1907.

Any account of Freyer's career would be incomplete without some reference to the once famous fee of a lakh of rupees—100,000 rupees, at the then rate of exchange about £6,600 — which he received from the Nawab of Rampur in the eighties. This was not a fee for a single visit or for a short course of treatment, but for a long course of regular treatment extending over sixteen months and including a serious operation. The patient was the brother of the then Nawab of Rampur, and for family reasons was very anxious to outlive his brother, the Nawab, and succeed to the principality as reigning Nawab. This, through Freyer's treatment, he was able to do. Immediately after his accession he made a public presentation to Freyer of the fee at the first durbar or court he held after his succession. The Government of India raised objections to the receipt by a medical officer of so large a sum of money, and (or so at least it was currently reported) first ordered him to return the money to the Nawab, and later either to do so or to retire from the service. Freyer declined to do either, on the ground that he had well earned the money, and in doing so had broken no rule of the service, but had only done what he was entitled to do. In the end this view of the case prevailed. The grant and receipt of this large fee, however, was what gave rise to the rules and regulations regarding acceptance of fees from Indian chiefs and gentlemen of high position, which created so much heart-burning and ill-will in the Indian Medical Service some twenty years ago, and which remained a source of discontent until the rules were amended on fairly reasonable terms soon after the late Sir Pardey Lukis became Director-General, eleven years ago. Freyer was subsequently promoted to the first-class civil surgeoncy of Benares, one of the most lucrative stations in the province, where he was surgeon to the Prince of Wales Hospital. In the end he retired, partly for health reasons, having received a blow on the eye from a lunatic in the Benares Asylum, which caused him to fear loss of sight. The Nawab of Rampur, who died long ago, also appointed him his medical officer.

Mr. J. W. THOMSON WALKER writes:

With the death of Sir Peter Freyer the profession loses one of its most striking and virile figures, and his colleagues mourn the loss of a stimulating and interesting personality. Freyer had two careers, each of which was crowned with success. Of the Indian career I cannot write, for he spoke little of it to his friends, although he may have discussed it with his intimates. With his career in London I had the advantage of being in close touch.

The London period had a central pivot around which all else revolved—namely, suprapubic prostatectomy. The operation that goes by his name, and that by his powerful advocacy was rapidly adopted throughout the surgical world, occupied more than any other subject his thoughts and absorbed his energy during the last twenty years of his life. It was the one surgical subject that appeared to him really worth discussing with his colleagues, and the discussion sometimes overflowed from the operating room to the dinner table. It would be ungrateful, as it is unnecessary, to raise again the points of controversy that raged around Freyer's claim to have originated the operation of suprapubic enucleation of the prostate. But apart altogether from the question of priority, looking around one can see no one who could so rapidly and with such dramatic force and completeness have changed the whole outlook of prostatic surgery as he actually did.

As a surgeon Freyer had many peculiarities that shocked the feelings of the purists of aseptic surgery. But there was character about his surgery as there was in everything else about the man. On familiar ground Freyer's operating was decided, purposive and rapid, and in some operations, especially that of litholapaxy, the manipulation was graceful. His technique was simple, and did not vary during the whole time that I knew him in London. Two characters always impressed me in Freyer's operations: he was thorough and conscientious. He looked to the ultimate result far more than the casual visitor to his operating theatre, who saw only a somewhat dramatic timed operation on the prostate, might have imagined.

As a debater Freyer had a quick grasp of the essential points of a subject. It took him but a second to see the weak point of one argument and the strength of another, and he wasted little time on fine distinctions. He was a fluent speaker and had a vein of wit, at times not without a tinge of sarcasm. When roused by a subject near to his heart he spoke with much force. As a descriptive writer Freyer cultivated a simple, direct style that was always lucid and usually convincing. His vocabulary was not extensive, but it sufficed for the subjects that most interested him and on which he wrote with greatest authority. In writing he always kept the high road to the goal at which he aimed; by-paths leading to other view-points and shady lanes of philosophic doubt had no attraction for him. As a result, his articles and books were easily read and assimilated by a wide circle of varying knowledge.

It was, I know, a source of sincere pleasure to Sir Peter Freyer that in 1920 he was asked to become the first president of the newly-formed Section of Urology at the Royal Society of Medicine; and it will be fresh in the memory of the members of the Section how keenly and with what conscientious care, in spite of failing health, he performed the duties of president. Freyer's character, as it appeared to a colleague, was that of a man with tremendous driving force, great determination, and fixed purpose. It was unavoidable that a man of this character

should wound the susceptibilities of some, but there was a kindly and sympathetic vein in Freyer's character that was touched more easily than many imagined.

A former colleague writes: A good many members of the Indian Medical Service have, from time to time, attained to high professional eminence in this country after leaving India. But they have usually been men who, like Drs. Charles Murchison and W. S. Playfair, had only spent a few years in India, and resigned the service while still young men. It has been given to few, like Freyer and the late N. C. Macnamara, to serve for twenty years or more and gain success and reputation in India, and then to earn still greater success in England, after their retirement. For many years Freyer managed the annual dinner of the Indian Medical Service, and the success of these yearly reunions was greatly due to his excellent management. He was always ready to help junior colleagues with his advice and assistance, and was most popular with his brother officers. *Multis ille bonis flebilis occidit.*

Previous to the removal of the body of the late Sir Peter Freyer for interment in his native place in the far west of Ireland, there was held, on September 12th, at 27, Harley Street, a memorial service, which was attended by about fifty of his most intimate friends and colleagues. The Irish Medical Schools' and Graduates' Association—on the executive of which he had served for seven years (the latter part being as Chairman of Council)—was represented by Sir Havelock Charles, G.C.V.O., Dr. Gubbins Fitzgerald, Dr. James Stewart, and Dr. Swift Joly.

T. ARTHUR HELME, M.D.EDIN., M.R.C.P.LOND.,
Consulting Surgeon, Northern Hospital, Manchester.

DR. T. ARTHUR HELME, whose death occurred at Rhosneigr, Anglesey, on September 5th, in his 61st year, was notable not only as a distinguished gynaecologist and obstetrician and a brilliant and successful operator, but as a leader of the profession in the arduous paths of medical politics. He was for a considerable time a member of the Central Council, and late president and honorary secretary of the Lancashire and Cheshire Branch of the British Medical Association, while during the war he was chairman of the Medical War Committee for Manchester and Salford.

Born at Lancaster, Thomas Arthur Helme was educated at the Royal Grammar School there and at the University of Edinburgh, graduating M.B., C.M., with honours, in 1885. At his final medical examination he was awarded the Buchanan scholarship, which carried with it the appointment of assistant to the professor of midwifery and gynaecology, and he was house-surgeon in the gynaecological wards of the Royal Infirmary and in the Royal Maternity Hospital. After holding these appointments he proceeded to Strasbourg, and as a result of his research work he was awarded a gold medal for the thesis for his M.D. degree, which he obtained in 1889. In 1890 he was appointed Freeland Barbour research scholar of the Royal College of Physicians of Edinburgh. He was a student also at University College, London, was an exhibitioner and gold medallist in materia medica in the University of London, and obtained the diplomas of M.R.C.S.Eng. and M.R.C.P.Lond. in 1894.

He had already made a mark in his special department of medicine, so that it was rather a surprise to his friends when he joined the well-known Dr. John Priestley in general practice at Fallowfield, Manchester. He did not, however, find the work of general practice so congenial as he expected, and, on the opportunity arising, Dr. Helme applied for and was appointed to the post of resident obstetric surgeon at St. Mary's Hospital, Manchester. After fulfilling his term of office there he was appointed assistant gynaecologist, and subsequently honorary surgeon, to the Northern Hospital for Women and Children. Although always hampered by ill health he soon built up a large practice all over the north of England as a consulting gynaecologist, and he published numerous papers on his speciality in the medical journals.

To those who did not know Dr. Helme's very keen sense of public duty it may, therefore, have been surprising that such a busy consultant, handicapped by his health, was eager to give up so much of his time to the interests of his fellow practitioners and the profession at large. He took a leading part in the campaign associated with the passage of the National Insurance Bill into law, and he never spared himself in endeavouring to uphold the dignity of the medical profession. When the Manchester Insurance Committee was formed he became a representative of the local medical profession upon it, and he was chairman of the Manchester Local Medical Committee.

One of the small band of Edinburgh graduates who have established the reputation of Manchester as a famous school of gynaecology, he always retained his interest in his old university, and was president last year of the Manchester Edinburgh University Club. Two years ago, before he had reached his sixtieth year, he was compelled to retire from the active practice of his profession on account of ill health, and was appointed consulting physician to his hospital.

Two of his brothers are medical men: Dr. J. E. Helme of Silverdale and Dr. G. Edgar Helme of Rusholme, Manchester; and another brother is Sir Norval Helme, lately M.P. for Lancaster.

We are indebted to Dr. T. A. GOODFELLOW for the following appreciation: Arthur Helme came to Manchester more than thirty years ago, and after a short, though what was to prove a valuable, experience in general practice, undertook the work of a consultant in obstetrics and gynaecology. He was a man of delicate physique, but of great determination; a sound diagnostician and a careful and successful surgeon, whose sympathy and kindness endeared him to his hospital and private patients alike. Early in his career he took a deep interest in medico-political work, and the profession in Manchester has probably never known a more devoted servant in this branch of activity. For many years Helme's personality was inseparably connected with the developments of the British Medical Association in Lancashire and Cheshire, and so it happened that when the crisis of the National Insurance Bill came his colleagues turned to him as their natural leader. There are many who remember with astonishment the amount of concentrated energy which a man of his constitution was able to devote to this work, for he was then in mid-career in a busy consulting practice, and his chairmanship of mass meetings of the profession, close committee work and innumerable conferences, both locally and in London, must have sufficed to satisfy the most ravenous appetite; but Helme felt that a great trust had been delivered into his hands, and his fixity of purpose permitted him to be satisfied with nothing less than the best that was in him. The final conference between the chairman of the Manchester Insurance Committee and delegates from a mass meeting, held at a late hour on the night before the Insurance Act was to become operative, is historical in that from it was evolved the "Manchester and Salford system" of working the Act, and the part taken in it by Helme—himself a strong opponent of the bill—was that of an able diplomatist. In 1915 a strong Medical War Committee was appointed by the whole profession—the most comprehensive and virile medical committee that Manchester has ever known—and there was never any doubt as to the selection of its chairman. In this office Helme's wide experience of the varying types of city and suburban practitioners, and his knowledge of the broad principles upon which the central organization was likely to act, were of very great value to his colleagues; the harmonious co-operation of non-panel and panel practitioners under the unique terms of the "Manchester Scheme," was to a great extent the outcome of his wise guidance and forethought. Ill health unhappily prevented him from presiding over the deliberations of that committee during the last eighteen months of its existence; but in his retirement he must have felt, as did so many of his colleagues, that his arduous labours on behalf of the medical profession and of the community had borne ample fruit.

GUSTAV MANN, M.D.EDIN., B.SC.OXON.

MANY in England, especially Oxford graduates, will hear with deep regret of the death, at Tampico on July 18th, of Dr. Gustav Mann in his 57th year, following an acute attack of dysentery.

Gustav Mann was born at Darjeeling, the eldest son of Gustav Mann and Marianna Stovel. Having graduated in

Edinburgh, he acted as assistant to Professor William Rutherford in the Physiological Department of the University from 1892 to 1894, was demonstrator of physiology in Oxford University from 1894 to 1908, and was professor of physiology at Tulane University in New Orleans from 1908 to 1916. For some time he acted as chemical analyst to oil companies. Finally he went to Tampico, where he was doctor to several of the oil companies, and had acquired a large practice in the treatment by inoculation of diseases of the skin. His health was severely impaired by the death of his younger son from malaria in 1920.

He was awarded the gold medal for his thesis for the degree of doctor of medicine of Edinburgh University. His researches in histology and physiology earned him the Dobbie-Smith gold medal (1889), and the Gunning-Victoria (1894), Goodsir (1895), Ellis (1900), and Rolleston (1900) prizes. Among his numerous publications were articles upon the mechanism of fertilization and the evolution of plants, the comparative anatomy of the brain, and the histological changes during activity and rest in neurons and the glandular cells of animals and plants. In 1902 he published his *Physiological Histology*, which must be regarded as the foundation of the conception of histological staining as a method of biochemical analysis. This work was followed in 1906 by *The Chemistry of the Proteids*. Gustav Mann was a genius, with the eccentricity of a genius and the genius's difficulty in expressing himself clearly in writing and speech. His enthusiasm for research was unbounded and his capacity for work astonishing. In order to maintain his capacity for work at the maximum he reduced his nourishment to a level which kept his weight at 7 st., and for long periods he would allow himself no more than four hours of sleep. Many will recall the mattress in his laboratory at Oxford, which enabled him to eliminate the distinction between night and day. As a practical histologist he had no equal.

He married Agnes Sinclair Orvez, fourth daughter of the late Francis Orvez of Edinburgh, who survives him, with one son.

Universities and Colleges.

CONJOINT BOARD IN IRELAND.

At the Conjoint Examinations in Ireland by the Royal College of Physicians and the Royal College of Surgeons the following candidates have been successful:

FINAL PROFESSIONAL EXAMINATION.—M. Barton, H. C. Bell, W. B. Burke, D. Clein, J. H. B. Crymble, R. H. Dolan, T. E. Dorran, C. J. C. Earl, M. A. English, M. Elyan, J. A. Fitzgerald, John Hewitt, F. W. Greene-Kelly, Alexandra H. C. Ledlie, J. I. Levi, B. A. McElhinney, Joseph McGuire, Michael Moloney, Eveleen M. Murphy, Mary C. O'Brien, P. J. Quigley, G. E. Strahan, John Shannon, T. A. C. Strevens, A. D. Watchman, B. Scher.

DIPLOMA IN PUBLIC HEALTH.—C. H. Brennan, R. G. Griffin, M. J. Loftus, J. P. de Villiers, R. MacLeod.

The Services.

NAVAL AND MILITARY HYGIENE.

THE annual general meeting of the Navy, Army, and R.A.F. Hygiene Group of the Society of Medical Officers of Health will be held at the house of the Society on Friday, September 30th, at 4.30 p.m. After the election of officers for session 1921–22 and other business, Major-General Sir W. G. Macpherson, K.C.M.G., C.B., will read a paper on the disposal of latrine contents, with special reference to immediate incineration. All members of the society are invited to attend and take part in the discussion.

Surgeon Rear-Admiral Sir P. W. Bassett-Smith, K.C.B., has been nominated to succeed Lieut.-Colonel H. R. Kenwood, C.M.G., as president of the group for the coming session.

HONOURS.

THE following appointments to the Order of the Indian Empire have been made for services during the operations in Mesopotamia:

C.I.E.—Colonel Arthur Hugh Morris, R.A.M.C., Lieut.-Colonels Alfred Eugene Berry, I.M.S., and Maxwell MacKelvie, I.M.S., Major (Acting Lieut.-Colonel) Henry Warwick Illius, I.M.S.

The following appointments to the Military Division of the Order of the British Empire have been made for valuable services rendered in connexion with military operations in Mesopotamia:

C.B.E.—Major and Brevet Lieut.-Colonel William Haywood Hamilton, C.I.E., D.S.O., I.M.S., and Lieut.-Colonel and Brevet Colonel Harold Hugh Norman, R.A.M.C.

O.B.E.—Major Arthur Samuel Arthur, R.A.M.C., Captain and Brevet Major Alan MacDonald Dick, I.M.S., Captain William Andrew Morton Jack, I.M.S.

The officers mentioned by Lieut.-General Sir J. A. L. Haldane, Commanding-in-Chief, Mesopotamian Expeditionary Force, "whose distinguished and gallant services and devotion to duty are recommended as deserving of special recognition" include:

Colonel A. H. Morris, C.B.E., and Lieut.-Colonel and Brevet Colonel H. H. Norman, R.A.M.C., Lieut.-Colonel and Brevet Colonel T. C. Mackenzie, D.S.O., Lieut.-Colonel G. J. Houghton, D.S.O., Major A. S. Arthur, Captain (Acting Major) C. M. Gozney, M.C. (killed), Captain H. C. Godding, M.C., Captain A. N. Minns, D.S.O., M.C., and Captain C. H. K. Smith, M.C., R.A.M.C.; Lieut.-Colonels A. E. Berry and M. MacKelvie, Major and Brevet Lieut.-Colonel (temporary Colonel) W. H. Hamilton, C.I.E., D.S.O., Major (Actirg Lieut.-Colonel) H. W. Illius; Majors J. W. H. Babington and A. A. McNeill, Captain and Brevet Major A. MacD. Dick, Captain E. Cotter, Captain W. A. M. Jack, and Captain J. W. Pigeon (killed), Indian Medical Service.

Medical News.

IN correction of a paragraph in the JOURNAL of August 27th we are asked to announce that the Swiss Society of Balneology and Climatotherapy will give a series of lectures and practical demonstrations at Lausanne from October 3rd to 8th, and that the yearly meeting of the association will be held on October 8th and 9th at Bex-les-Bains. The council will be pleased to welcome English physicians at Lausanne or Bex; information may be obtained from Dr. F. Wanner, Avenue de Rumine 45, Lausanne.

THE annual distribution of prizes at Charing Cross Hospital Medical School (University of London) will take place in the out-patients' hall of the hospital on Wednesday, October 5th, at 3.30 p.m. The prizes will be presented by Sir Frederick Mott, K.B.E., M.D., F.R.S., and Sir Herbert Waterhouse, M.D., F.R.C.S., will take the chair. The annual dinner of past and present students will be held on the evening of the same day at the Adelaide Gallery, Gatti's Restaurant, at 7 for 7.30 p.m. The chairman will be Sir James Galloway, and the guest of the evening Sir Frederick Mott. Tickets (12s. 6d. each) may be obtained from the Dean, or may be paid for at the door.

THE opening ceremony of the winter session at King's College Hospital Medical School (University of London) will be held at Denmark Hill on Friday, September 30th, at 3 p.m. The introductory address will be given by Lord Gorell. The annual dinner of past and present students will be held at 7 for 7.30 on the same day at the Café Royal, Regent Street, W., with Mr. F. F. Burghard, C.B. (senior surgeon of the hospital), in the chair.

AT the National Hospital for the Paralysed and Epileptic, Queen Square, Bloomsbury, W.C., post-graduate courses will be given during the winter term beginning on October 3rd. Three courses will be given: (1) Clinical lectures and demonstrations, (2) neuro-pathology, (3) lectures in the anatomy and physiology of the nervous system. A fee of £8 8s. will be charged for the clinical lectures and demonstrations. Those taking this course will be entitled to attend the course in pathology without further payment. The fee for the pathological course alone, or for the course in anatomy and physiology, is £5 5s. Holders of the Fellowship of Medicine's ticket for the National Hospital will be admitted to the clinical lectures and demonstrations and to the course in pathology.

A COURSE of twelve lectures on the management and feeding of infants and young children will be given by Dr. Eric Pritchard (physician in charge of the Infant Welfare Department) to qualified medical practitioners, commencing Wednesday, October 5th, at the St. Marylebone General Dispensary, 77, Welbeck Street, Cavendish Square, at 6 o'clock in the evening. The subjects include "Causes of infant mortality," "How to conduct an infant consultation," "Breast feeding," "Artificial feeding of infants," "Uses of dried milk and patent foods," "Management of difficult cases," "Treatment of minor ailments," "Rickets," and "The feeding of children between 9 months and 2 years." Students taking out this course may attend the infant consultations held by Dr. Pritchard on Tuesdays at 11 a.m. and Thursdays at 3 p.m. at the Dispensary. Visits will be paid on Saturday afternoons to the Nursery Training School, 1 Wellgarth Road, Golders Green. The fee for the course is two guineas, payable to the Secretary, 77, Welbeck Street, W.1.

DR. CLARENCE L. STARR, senior surgeon to the Hospital for Sick Children, Toronto, has resigned that post to accept the chair of surgery at Toronto University. Dr. Starr served during the war as lieutenant-colonel in the C.A.M.C., being attached to the Ontario Medical Hospital at Orpington, Kent.

BARON GOTO, who has recently been appointed Mayor of Tokyo, is a member of the medical profession, having formerly been a professor in a prefectural medical school in Japan, and later attached to the Public Health Department in the Ministry of Home Affairs. He graduated M.D. in the University of Berlin in 1892; he has had a remarkable public career, and was at one time a member of the Japanese Cabinet. According to the *Japan Medical World*, important sanitary and other improvements in the city of Tokyo, involving an expenditure of 800 million yen, have been proposed by the new mayor and have already been approved by the county council.

A SURVEY of mental disease in the United States shows that on January 1st, 1920, there were 232,680 persons with mental disease in institutions in the United States. Of these, 40,515 were mental defectives, 14,937 epileptics, 1,163 alcoholics, and 808 persons addicted to drugs. In the hospitals of New York State there are 38,903 patients, of whom 5,762 are mental defectives, 1,683 epileptics, 67 alcoholics, and 156 drug addicts. These figures are interpreted as meaning that out of each 100,000 persons in New York State 374.6 are afflicted with mental disease and 55.5 are mental defectives.

THE *Riforma Medica* states that the Government of Czecho-Slovakia has organized a system of insurance against disease, obligatory for all with incomes less than 20,000 crowns, and optional above this. The choice of the medical practitioner is to be unrestricted.

AN institute of hydrology and climatology, containing laboratories, a museum, and a library, was inaugurated recently at the College of France. Lectures in hydrology will be given, and courses will be held to train specialists for watering-places and thermal and climatic stations.

THE sixth International Congress of Physiotherapy will be held at Madrid in May, 1922, under the presidency of Professor Calataynd Costa.

AN institute for research in tropical diseases is to be founded in Panama City as a memorial to General Gorgas, the Government of Panama having already presented the site. A committee has been formed in America, of which Dr. Franklin H. Martin is chairman, to raise maintenance funds for the institute.

THE Broad Street Hospital, New York, announces that on October 15th it will open a post-graduate school of medicine intended particularly for ships' surgeons; one of the chief features will be a course on tropical diseases. Each course will last one month, and will be repeated indefinitely, so that ships' surgeons who are in New York for a week can take part of the course and then continue it when in New York again. The secretary of the post-graduate school is Dr. Maximilan Stern.

DR. ALEXIS CARREL has been elected a national associate of the French Academy of Medicine, of whom there are only twenty; Dr. Carrel, who is, however, of French birth, is the first to be elected when not resident in France.

THE twenty-sixth congress of the Italian Medical Society will take place at Naples from October 25th to 27th, with Professor Antonio Cardarelli as president.

AN international congress of ophthalmology will be held in Washington, U.S.A., at the end of April next.

RECENT statistics show that the infant mortality in France is 11.9 per 1,000.

UNDER the Sale of Food Order, 1921, local authorities for the purposes of the Sale of Food and Drugs Acts are invested with the power of enforcing the requirements of the Order regarding the labelling of imported produce, the composition of jam and marmalade, and the composition of dripping, margarine and other edible foods. The enforcement of the provisions regarding the weight of bread and tea is now also entrusted to the local authorities for the purpose of the Weights and Measures Acts. In a circular issued recently by the Ministry of Health to local authorities giving the essential details of these Orders, it is pointed out that bread must be sold by weight, and a loaf must weigh one pound or an even number of pounds. Tea, whether contained in a packet or not, must be sold by net weight and in multiples of ounces or pounds. Any imported meat, bacon, ham, or lard must, when exposed for sale, bear a label with the word "imported" or words disclosing the country of origin; eggs which have been imported into the United Kingdom must not be sold as "fresh" or "new laid," unless the description similarly includes the word "imported" or words disclosing the country of origin. In regard to jam, the water-soluble extract must not be less than 65 per cent. of the jam, and not more than 10 per cent. must consist of added fruit juice; marmalade must be made of citrous fruits and fruit juices, unless the other varieties of fruits or vegetables used are mentioned in the description.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2630, Gerrard.

2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*: telephone, 2630, Gerrard.

3. MEDICAL SECRETARY, *Mediocra, Westrand, London*; telephone, 2630, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*: telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh*; telephone, 4361, Central).

QUERIES AND ANSWERS.

INCOME TAX.

"T. M. C." was out of professional practice from January 1st to June 15th, 1921. The inspector of taxes writes: "The assessment for 1921–22 is on £1,225, the average, and this will fall to be apportioned as regards the allowances to the various persons interested in the practice during 1921–22." What is "T. M. C." to return?

*** Assuming the average assessment to be correct, the locomotion expenses will have already been taken into account, and the "allowances" in question will be the personal ones—that is, £225 for self and wife, life assurance, etc. The amount to be returned by "T. M. C." is the proportion applicable to the period from June 15th, 1921, to April 5th, 1922—that is, £987, and he is liable to payment of tax on that sum, less the appropriate personal allowances.

"N. A. B." bought a second-hand Standard two-seater in February, 1917, for £170—original price, £195; in May, 1920, he bought a new 20-h.p. Austin four-seater touring car for £695, selling the Standard car for £310, the price of a new Standard being then £595. What allowance can be claimed?

*** The figures suggest that the cost of a two-seater Standard in May, 1920, in a condition similar to that in which "N. A. B." purchased his Standard in 1917, might reasonably be placed at 170/195 of £595=£518. On that assumption our correspondent would be entitled to an allowance of £518−£310=£208; the balance of his net expenditure of £385 represents improvement of his professional assets.

"H. E. G." inquires as to the position with regard to tax payable for the second year of a restarted practice.

*** The assessment has been made on the basis that the practice is a new one; in that case "H. E. G." is entitled during the first three years to revise his return at the end of the financial year by application for a reduction of the sum assessed to the actual profits of the year, under a provision introduced into the Income Tax Acts in 1917. If the second instalment be paid, it would *pro tanto* increase the amount repayable; but this seems to be a legal requirement, though insistence on it does not appear necessary, as the mode of adjustment on "applications" is by way of repayment. It is, perhaps, advisable to mention that this right of adjustment to the profits of the year does not apply to purchased practices, but only to new ones in the full meaning of the term.

"C. J. M." inquires whether the assessor is correct in insisting that tax must be paid on honoraria in respect of hospital appointment.

*** We are not aware of any regulation under which honoraria which are granted for services rendered are exempt from taxation, but the Board of Inland Revenue agreed some time ago to acquiesce in the practice of treating the honorarium as a professional fee falling into the general receipts assessable under Schedule D. In many instances the expense of attendances at the hospital equals or exceeds the amount of the annual honorarium, and in such cases the

practice referred to does give substantial exemption as the inclusion of the amount receivable is counter-balanced by the inclusion of the expenses incurred in that connexion. We suggest that "C. J. M." should notify the local inspector that he will include all fees, whether assessable Schedule D or Schedule E, in his general return of professional profits.

LETTERS, NOTES, ETC.

CHRONIC NASOPHARYNGEAL INFECTION.

DR. H. BODKIN (Bloemfontein, O.F.S., South Africa) writes: I suggest that in the cases of "chronic nasopharyngeal infection, chronic toxaemia, and distressed heart in children," so interestingly and ably described by Dr. C. Paget Lapage in an address published in your issue of July 2nd, the actual focus of infection lies deeper than there depicted; that it is within the nasal accessory sinuses, particularly the sphenoidal sinus and posterior ethmoid; and that direct treatment to these cavities will produce results, when douching of nasopharynx and drill have failed.

TREATMENT OF HICCOUGH.

DR. E. F. O'FERRALL (Brixton, S.W.) writes: The examples quoted in the contributions you have published during the last few months suggesting hiccough as a prodrome of encephalitis lethargica and other diseases are instances of *post hoc* or *propter hoc*. The number of cases which can be quoted in support of the contention are perilously few, and of the hiccoughs, epidemic or otherwise, where there are no sequelae, we have no records. Regarding treatment, the following case, which occurred a few weeks ago, was instructive: A man, between 50 and 60, was attacked without assignable cause with violent hiccough, which, however, only once occurred during sleep. Intermittent attacks followed at frequent intervals for three or four days. I tried all the usual remedies, including large doses of morphine and inhalations of chloroform, without result. As a last resort I introduced a rubber stomach tube during an exacerbation of the spasm, and, like magic, it stopped instantly. True, the hiccough recurred after an interval, but the same remedy never failed, and after five or six hours the trouble was at an end. It was quickly discovered that it was unnecessary to run the tube into the stomach—a few inches into the oesophagus sufficed. No vomiting ensued. The inference is obvious. I am aware that the stomach has been washed out under similar circumstances, but this simple remedy seems to be worthy of record.

VON PIRQUET'S TEST.

DR. T. GERALD GARRY, M.B.E. (Cairo), writes: In the account of the International Tuberculosis Conference, appearing in the JOURNAL, Dr. Wilkinson is reported as having said the von Pirquet test is unreliable, while Sir Humphry Rolleston counselled as not Utopian a periodic census of all persons, classifying them by means of von Pirquet's test, and segregating them accordingly, either temporarily or permanently. I think, considering the serious differences of opinion so frequently expressed concerning elementary points in medical practice, some means should be adopted to prevent at least the perennial discussions to which they give rise.

INFANT MORTALITY IN HONG KONG.

WE have received from Hong Kong a copy of the *Hong Kong Daily Press* of May 26th, 1921, containing a report of a meeting of the Hong Kong Sanitary Board, when questions were asked and official replies given regarding a statement attributed to Mrs. Neville Rolf, a member of the Commission sent out to the Far East by the National Council for Combating Venereal Diseases, in reference to infant mortality in Hong Kong. Dr. Koch, a member of the Sanitary Board, stated that the following cablegram had been published by Reuter: "At a meeting of the National Council on Venereal Diseases, to which the mission to the Far East presented its report, Mrs. Neville Rolf declared that she was never so ashamed of being an Englishwoman as she was in Hong Kong, where the registered infant death rate was eight hundred higher than the birth rate, despite British occupation for eighty years." In reply to questions by Dr. Koch, Dr. W. W. Pearse, Medical Officer of Health, gave the following answers: "(1) Vital statistics in the colony are officially the affair of the medical officer of health. No information as to infant mortality was asked from me by Mrs. Neville Rolf and I do not know how she obtained her figures; (2) no infant mortality rate has been calculated; (3) the infant mortality rate in a given locality is the ratio of the deaths of infants under 1 year of age in that place during one year to the number of children born in that place during the same period. In Hong Kong we do not know: (1) how many children are born here in any given year, nor (2) how many children who die here are brought to the colony in bad health, and therefore cannot calculate a corrected death rate. All deaths are registered in order that burial may take place, but it is not the custom of the majority of the Chinese to register births. Birth rates are calculated at so many births per thousand of the population per annum, and therefore are not comparable with infant mortality rates. Such births as are registered here are chiefly those of males—for example, of 400 births registered during the first quarter of 1921, only 90 are of females, equal to 22.5 per cent., while 1,456 births attended by registered midwives during the first four months of this year show 100 males to 85.7 females."

THE ISLANDERS OF THE PACIFIC.

LIEUT.-COLONEL T. R. ST. JOHNSTON writes from Government House, Leeward Islands: I wish to correct a slight error in the review of my book, *Islanders of the Pacific*, in your issue of July 2nd (p. 14), and that is that I am there spoken of as being now the Governor of the Falkland Islands. I was Acting-Governor there last year at the time the book went to press, hence possibly the mistake; but since then I have moved to the West Indies, being at the present time Acting-Governor of the Leeward Islands. The Governor of the Falkland Islands is Mr. J. Middleton, C.M.G.

BADLY LIGHTED WORKROOMS.

"PANEL PRACTITIONER" writes: The remarks of "An Old Colliery Doctor" and J. Boyd Primmer are timely. Those of the public who remember that thrice within the last three years the miners have seized the nation by the throat and tried to strangle it, and those of our profession who, like myself, have seen children dying in rooms in which there were no fires owing to want of coal, are not likely to be comforted by reflecting that the strikers are the better for a nice long holiday. But I am concerned for a section of the public who appear to be in a worse plight than miners owing to the exigencies of their occupation. I refer to those compelled to work in rooms artificially lighted. As a result of building over the back gardens of the houses in the central parts of most old towns in order to obtain an increased office space this condition unavoidably comes to pass. Such extensions necessarily encroach on each other, and daylight—not to mention sunlight—cannot be introduced. Many people, therefore, have to work for long hours under conditions which eventually react unfavourably on their health. For these I suggest "a fortnight's holiday every three months."

MADEIRA AND THE CANARY ISLANDS.

"S." writes: I would strongly advise intending passengers to take with them a good supply of insect powder, etc., as many of the boats are infested with bugs, which are dormant in northern latitudes but become very aggressive directly the warm weather is reached. They are very elusive, and I was for some days on my first voyage under the mistaken impression that I was suffering from urticaria, and dosed myself with calcium lactate until I had a confidential chat with the ship's doctor.

POSTAGE TO PLACES ABROAD.

SEVERAL correspondents resident abroad have mentioned in recent correspondence that letters from this country are often insufficiently stamped. The Postmaster-General has now issued a circular calling attention to the fact. Such letters, he states, are duly forwarded and charged on delivery with double the amount of the deficiency; the surcharge is retained by the foreign administrations. The prepaid rate of postage on letters for all foreign countries (except the United States of America and Tangier) is 3d. for the first ounce and 1½d. for each succeeding ounce or fraction of an ounce; from the United Kingdom to British possessions generally, the United States, Tangier, and H.M. ships and troops on foreign stations, the letter rate is 2d. for the first ounce and 1½d. for each succeeding ounce or fraction thereof.

VACANCIES.

THE Home Secretary gives notice that, in consequence of the resignation of Dr. J. A. Dewar, the appointment of Medical Referee under the Workmen's Compensation Act for the Sheriffdom of Forfar is vacant. Applications should reach the Private Secretary, Scottish Office, Whitehall, S.W.1, not later than October 1st.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 31, 32, 33, 36, 37, and 38 of our advertisement columns, and advertisements as to partnerships, assistantships, and locum tenencies at pages 34, 35, and 36.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Six lines and under	0	9	0
Each additional line	0	1	6
Whole single column (three columns to page)	7	10	0
Half single column	3	15	0
Half page	10	0	0
Whole page	20	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Tuesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.